JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

Vol. LXXV Part 3

MARCH 1950

PAGE

The Secretary's Page 81
Camellia and Magnolia Conference, 1950 83
Wisley in March 85
Notes on a few plants from S.E. Tibet. By George Taylor, D.Sc. *Illustrated* 87
The Production of Quality in Apples. By Professor T. Wallace, C.B.E., M.C., D.Sc., F.R.I.C. *Illustrated* . . . 91
New and Noteworthy Plants:
Calceolaria Darwinii. By Colonel F. C. Stern, O.B.E., M.C., F.L.S., V.M.H. *Illustrated* . . . 106
Roses as Flowering Shrubs. By J. Wilson. *Illustrated* . 107
Notes from Fellows:
Paeonia Potaninii. By Major A. Pam, O.B.E., M.A., F.L.S., V.M.H. 108
Plant Growth under Controlled Conditions. By Professor R. H. Stoughton, D.Sc. 109
Can we increase the vigour of Difficult Species? By P. H. Davis 110
Forms or Hybrids. By G. H. Berry 110
The Life of a 'Variety'. By Claude L. Piesse . . 112
Grey Bulb Rot of Tulip. By W. C. Moore. *Illustrated* . 113
Wisley Trials, 1949:
Amaryllidaceae 117
Early Flowering Chrysanthemums 126
Dahlias 130
Plants to which Awards have been made in 1949 . . 135
Book Notes 136
Proceedings xxxvii

VINCENT SQUARE, LONDON, S.W.1.

PREVENT

spray with BOUISOL WHITE OIL SPRAY after pruning

Bouisol White Oil Spray leaves no unsightly deposit—it does not harden the plant nor impede the growth. The white oil checks Red Spider and increases the covering power of the Spray. It can be used with Nicotine, DDT, or Derris Insecticides.

Obtainable from Branches of

Boots

THE GARDENER'S CHEMISTS

BOUISOL WHITE OIL SPRAY ALSO CONTROLS

TOMATO LEAF MOULD

POTATO BLIGHT ON TOMATO

CUCUMBER MILDEW

1 pint (sufficient for 10 gallons of spray 3/6d.)

EN-TOUT-CAS

By Appointment to H.M. King George VI. Hard Lawn Tennis Court Makers

By Appointment to H.M. the King of Sweden. Hard Lawn Tennis Court Makers.

The largest makers in Great Britain of all types of

SPORTS GROUNDS and
HARD LAWN TENNIS COURTS

HARD COURTS at

All-England Club, Wimbledon, in use 21 years
West Hants Club
Hard Courts Championships - - in use 20 years
Queen's Club, Kensington - - - - in use 25 years

RUNNING TRACKS at

Wembley (used for Olympic Games) and **White City**
33 Records Broken or equalled on these two Tracks to date.

Please send enquiries or send for new Booklet to :—

THE EN-TOUT-CAS CO. LTD., SYSTON, Near LEICESTER (Syston 86163, 4, 5, 6)

LONDON OFFICE at HARRODS, KNIGHTSBRIDGE, S.W.1 (Sports Dept.—1st Floor) Tel. : Sloane 8117-8

Sutton's Seeds

AND EVERYTHING
FOR THE GARDEN

SUTTON'S GARDEN
SEED CATALOGUE

Free on request

SUTTON & SONS LTD., READING

Waterer's

GREAT SPRING SALE

of

HERBACEOUS & ALPINE PLANTS

AT 1/- EACH

Exceptional bargains are offered in a wide range of Herbaceous and Alpine Plants.

20 PLANTS FOR £1.0.0.

Carriage Paid and Packed free.

Also Roses, Fruit Trees, Shrubs and attractive collections at reduced prices.

Please write for Special List Post Free.
Stock of the finest quality grown by

JOHN WATERER, SONS & CRISP, LTD.
THE FLORAL MILE - TWYFORD - BERKS.
Telephone: WARGRAVE 224-225

STRAWSON TIMBER-FRAMED GLASSHOUSES

We are once more in a position to supply any type and size of Glasshouse for Essential Food Production purposes against licences, and shall be happy to send estimates and full particulars on receipt of enquiries. (Where timber permits are not available we can arrange to build in licence-free Empire Hardwoods)

Our STRAWSON'S IMPROVED PATENT GLAZING on Aluminium Channelled Sash Bars, now incorporating anti-condensation grooves, ensures a tremendous saving in subsequent upkeep costs and provides maximum light combined with strength and durability. Glasshouse Food Production experts immediately appreciate the many great advantages of STRAWSON'S IMPROVED PATENT GLAZING which we are now exporting to all parts of the world.

We are only too pleased to handle all matters in connection with Licence Applications, on behalf of our clients, and our experience in the design and construction of only GOOD GLASSHOUSES during the past 60 years is placed freely at their disposal.

Surveys of Inspection arranged in any part of the country at short notice.

Write for List RHJ. 50—A wide selection of Garden Frames always in stock.

G. F. STRAWSON & SON

Builders of Good Glasshouses since 1892

HORLEY — SURREY

Telephone: Horley 138

Chase BARN CLOCHES

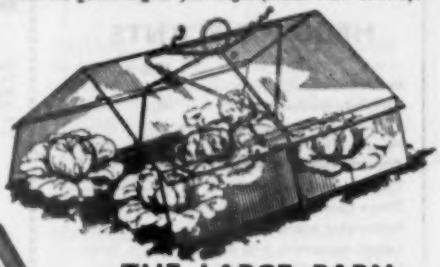
★ *I consider Chase Cloches my best investment since I started gardening 30 years ago. (Letter from Oxford).* ★

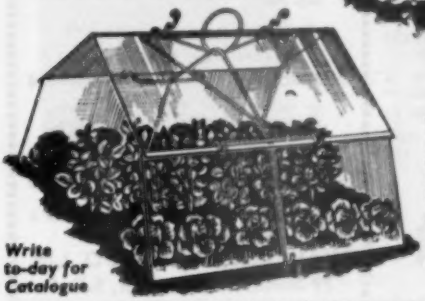
THE LOW BARN

24 ins. long, 22 ins. wide, 12 ins. high.

Easily the most popular all-purpose cloche on the market. Millions are in use. Miraculous results with Salad Crops, Strawberries, Tomatoes, Lettuce, Root Crops, etc. *Be advised to order early.*

Pack of 10 (20 ft. run) £3 17 6
Case of 30 (60 ft. run) £10 17 6
Box deposit 10/- ex. returnable





Write to-day for Catalogue

THE LARGE BARN

24 ins. long, 22 ins. wide, 19 ins. high.

The Large Barn is invaluable for tall growing crops on account of its liberal amount of head-room. The side glasses are 12 ins. high as against the Low Barn's 6 ins. In all Barn patterns a roof glass can be instantly removed to afford access to crops without lifting or weakening the cloche.

Pack of 8 (16 ft. run) £3 17 6
Case of 24 (48 ft. run) £10 17 6
Box deposit 10/- ex. returnable.

CHASE PROTECTED CULTIVATION LTD., 38 CLOCHE HOUSE, SHEPPERTON, MIDDX.

Your Crops and Flowers are LIQUID FEEDERS

3/- bottle (three types) makes up to 128 gallons finest Liquid Manure.

Also in 1/6 bottles.

Sold everywhere.

½ gal. containers, 10/6 carriage paid.

Read all about "Liquid Manure Gardening," in the 128 pp. illustrated book at 1/- post free.

Plant life absorbs its food from the soil in liquid form. Healthy crops need more food than the soil normally provides. Your crops will be healthier and larger if you feed them on Liquinure as and when needed and in quantities and strengths suited to the stage of growth. Liquinure is the scientifically balanced concentrated liquid manure.

LIQUINURE SALES, Borehamwood Herts.

LIQUINURE
LIQUID PLANT FOOD

STEWARTS NURSERIES FERNDOWN

HEDGING PLANTS

	Doz.	per 100
Escallonia in var., 2½–3 ft.	36/–	270/–
Forsythia spectabilis, 2–2½ ft.	45/–	300/–
Pittosporum Buchananii, 2–2½ ft.	48/–	350/–
Pyracantha in var., 18–24 in.		220/–
Olearia Haastii, 18–24 in.	30/–	200/–
Thuya Lobbii, 18–24 in.	60/–	450/–
Thuya Lobbii Zebrina, 18–24 in.	60/–	450/–
Cotoneaster applanata, 2–2½ ft.		130/–
Laurel caucasica, 2–2½ ft.		250/–
Laurel rotundifolia, 2–2½ ft.		250/–
Quick Thorn, 1–1½ ft.		30/–
Quick Thorn, 1½–2 ft.		45/–

Catalogues on application.

Special quotations for large quantities.

Carriage and Packing at Cost Price.

D. STEWART & SONS LTD.

Ferndown Nurseries, Ferndown, Dorset

EST. 1742

WAKELEY'S

(Registered Trade Mark)

4-FOLD HOP MANURE

Stable manure is scarce, but you'll find Wakeley's Four-Fold Hop Manure a perfect substitute—Humus, Nitrogen, Phosphates and Potash—everything the soil needs from seedtime to harvest—to enrich it, and stimulate and sustain plant life and growth.

PRICES:

Small Bag 5/9d., Medium Bag 8/9d., Large Bag 13/6d., 10 large Bags 130/–, 20 Large Bags 250/–.

Prices subject to alteration without notice.

FROM ALL THE BEST NURSERYMEN AND SEEDSMEN

or carriage paid England and Wales (Scotland 1/6 Large Bag; 1/– Medium Bag; 9d., Small Bag extra). If any difficulty, write to address below.

Write for our new and comprehensive catalogue giving information concerning Wakeley's Hop Manure, Fertilizers etc.

Our Spring List of Gladioli, Seeds, Plants etc. is also now ready, free on application.

WAKELEY BROS. & CO. Ltd.
79 Bankside, London, S.E. 1.

EARLIER, BIGGER CROPS

with GLASS

High Tensile Steel Frame to last a lifetime

Like a Greenhouse, but far less cost. Fully protects Tomatoes, Vegetables, Soft Fruits, Flowers, on the garden, through all stages, in all weathers. "Results from Taco were better than greenhouse," writes Mr. C. C. of Manchester. "*Earn and save me many pounds*," writes Mr. W. S. of S. Devon. **Popular size 4 ft. 10in. high, 6 ft. long**; other sizes lower, taller, longer. Easy to erect, or move to any part of garden. **High-tensile steel frame; lasts a lifetime**, stands up to gales. Complete with all glass.

FOR ILLUS. BOOKLET of all models of TACO SUPER CLOCHES, send 2½d. in stamps to TACO, Dept. RHS 3, BURNLEY, LANCS.

TACO SUPER CLOCHE

By Appointment

Nurserymen & Seedsmen to H.M. the Queen

HILLIER & SONS

for

TREES & SHRUBS

Growers commercially of the greatest number of species and varieties hardy in the temperate regions. Our revised catalogue is the most complete issued since the War

also

Herbaceous and Alpine Plants
Roses ***(including Species and Old-fashioned varieties)***

Fruit Trees, Bulbs, Seeds and all garden requirements

Please ask for those catalogues in which you are interested

WINCHESTER

Carters
TESTED SEEDS

SOW NOW

SWEET PEAS

THE QUEEN OF ANNUALS

Novelties for 1950

CREAM DELIGHT.—Gold Medal Scottish Sweet Pea Trials, 1948. A very large cream, with flowers of great substance, well placed on long stout stems. 18 seeds **2/6.**

FAIRY PRINCESS.—Award of Merit N.S.P.S. and R.H.S. Trials, 1946. Certificate of Merit Scottish Trials, 1946. A delicate pink on cream. Suitable for both garden and exhibition. 18 seeds **2/6.**

SCARLETT O'HARA.—Awards of Merit N.S.P.S. and R.H.S. Trials, 1946. A pure scarlet of robust constitution which revels in the brightest sunshine. 18 seeds **2/6.**

For complete list of Sweet Peas, see the "Blue Book of Gardening" Catalogue.

CARTERS TESTED SEEDS LTD.
RAYNES PARK, LONDON, S.W.20
134 Regent Street, W.1 — 129 High Holborn, W.C.1
53a Queen Victoria Street, E.C.4 — Houston Road, S.E.23

REVOLUTION IN GLASSHOUSE PEST CONTROL

by

Aerovap

CONTINUOUS FLOW AEROSOLS

NO Spray, Damaging Droplets, Smoke, Sealing of Houses, or Scorching of Tender Plants.

CONTINUOUS CONTROL OF
Red Spider Mite, Thrips, Aphis, Scale Insects, Mealy Bug, White Fly, Tortrix, Woodlice, etc.

"No effective means were found of eradicating a heavy infestation of Mealy Bug in the Temperate House at Wisley before the installation of a Continuous-flow Aerosol discharging D.D.T."

R.H.S. Journal—October, 1949

For use with electricity supply voltages 100/110v. and 200/250v. D.C./A.C.

Prevention is better than cure. INSTALL YOUR AEROVAP NOW and keep your houses clean throughout the year

For full particulars:—

SHEPHERD'S AEROSOLS LTD., DEPT. 21., 23, OLD BOND STREET, W.1. REG. 5560

BENTLEY'S
HORTICULTURAL PRODUCTS

Creobol (Winter Wash). A standard dual-purpose combination of tar oil petroleum emulsion.

Garden Frame Mats and Dutch Reed Mats. Weed Destroyers, Fertilizers, Insecticides. Fungicides, Fumigants, Daisy Killer. Moss Destroyer, Fairy Ring Destroyer, Loams, Sand, Charcoal, Peats, Wheelbarrows, Bamboo Canes, Tools, Twines, Papers, Gloves, etc.

Send for a FREE copy of our new general Catalogue including prices and particulars of above and many more garden requisites.

JOSEPH BENTLEY LIMITED
Horticultural Manufacturing Specialists
BARROW-ON-HUMBER, LINCS.

Books by post

CHRYSANTHEMUMS
For Amateur and Market Grower
by F. W. Allerton, B.Sc. ... ... 18s 9d.
Of especial interest to practical gardeners in providing a scientific treatise in understandable terms. All aspects of cultivation are fully dealt with, as well as the production of new varieties.

PEACH ORCHARDS IN ENGLAND
by Justin Brooke ... ... 9s. 8d.
From personal experience, the author claims that peaches equal to any grown overseas can be produced in England as easily as apples. This book details the varieties to plant, suitable sites, cultivation, marketing etc.

THE GRAPE VINE IN ENGLAND
by Edward Hyams ... ... 16s. 9d.
This book effectively refutes the mistaken notion that the English climate is inimical to the outdoor grape vine. The author's survey provides useful experience from the past, which, allied to modern practice, provides a technique for the cultivation of vines in the small garden or on a commercial scale. All the technical problems of cultivation are fully dealt with, together with a chapter on making wine.

CARNATIONS FOR AMATEURS
by J. L. Gibson ... ... 4s. 3d.
A professional grower shows how to produce the best results. Cultivation out-of-doors and under glass, propagation, fertilisers, rearing new varieties etc., perpetual flowering blooms, dianthus species, malmaison carnations, etc. A special chapter is devoted to cultivation in nutrient solutions.

CHRYSANTHEMUM STOPPING ILLUSTRATED
by John B. Stevenson ... ... 1s. 3d.
The important questions of stopping and timing are described and illustrated by 37 photographs which present very clearly the methods detailed.

Ask to receive our free monthly list giving contents-summaries of all new books on gardening.

STOBART & SON LTD.
9 VICTORIA STREET, LONDON, S.W.1

ECONOMICAL PRACTICAL and WELL BUILT

We can supply either one of our standard designs or can build to your own ideas. We shall be happy to send you our illustrated catalogue or give you a keen quotation against your rough sketches. Extended payment terms available.

H. & H. BLACKNELL LTD.,
DEPT. 41, FARNBOROUGH, HANTS
'Phone: Farnborough, Hants. 106

HERBACEOUS PLANTS

The following are outstanding additions for the Flower Border

IRIS ALASTOR, pink, 3/6;
HEMEROCALLIS HOORDOWN, large golden trumpet shape flowers, 3/6;
CHRYSANTHEMUM HORACE REED, double white, flowering all summer, 2/6;
VERBASCUM PINK DOMINO, 2/-;
One of each for 10/6; 3 each for 30/-.

MICHAELMAS DAISIES
SIX FINE VARIETIES

MELBOURNE JOY, lavender; **BLUE GOWN**; **OLGAR KEITH**, pink; **MAGGIE PERRY**, mauve; **BEECHWOOD CHALLENGER**, crimson; **GRACE SWEET**, dark blue.

The six for 10/-; 3 of each for 25/-.

LIST FREE ON REQUEST

GEO. BUNYARD & CO., LTD.
THE NURSERIES, MAIDSTONE

Laxton's Seeds

KNOWN & GROWN EVERYWHERE

Raisers for over three-quarters of a century, our name is a household word among gardeners for unbeatable quality.

SEND NOW FOR OUR NEW SEED CATALOGUE

A comprehensive range of all the leading varieties of VEGETABLES AND FLOWERS.

As the originators of the forerunners of the culinary pea of today and breeders of many present commercial varieties our experience stands second to none.

IT PAYS TO BUY FROM THE RAISERS

SPECIAL COLLECTIONS of vegetable seeds for the garden and allotment which contain sufficient for a year's supply of vegetables. 6/-, 8/-, 11/3d., & 21/- post paid.

All Seeds are of specially selected strains

LAXTON BROS
BEDFORD LTD
63 HIGH ST BEDFORD

For a quick knock-out

Most of the insects which are destructive in the garden are soft-bodied and therefore susceptible to derris. Now comes derris at its most potent—SHELL LIQUID DERRIS. This much improved version of a popular insecticide has been prepared after a great deal of research. It destroys a wide range of pests, such as Greenfly, Blackfly, Caterpillars, Thrips and Red Spider. Is harmless to humans, animals and birds. Economical, too, for the ½-pint tin, costing 2/6, makes 5 gallons of spray; the quart size, costing 7/6, makes 20 gallons. Also supplied in larger quantities.

SHELL

Shell Liquid Derris

The majority of Shell Sprays are available in both large quantities and in small packs, to meet the requirements of all sizes of gardens and orchards.

SHELL GARDEN ADVISORY SERVICE answers, without charge, any questions on the control of plant pests and diseases. Please send queries with stamped and addressed envelope to the address below. A useful month-by-month Spraying Calendar may also be had free on request.

SHELL CHEMICALS LIMITED
(DISTRIBUTORS)
Dept. (N.17), 112, Strand, London, W.C.2

HA1

OPEN, PARTLY OPEN OR CLOSED IN A SECOND!

The chief difficulty with Dutch Frames has always been the manipulation and hooking of the opening lights. Heavy, cumbersome glazed lights have been slow in adjustment. Valuable cultivation space has had to be given up to make room for operation and storage. Costly breakages and frequent repairs have shown the urgent need for a complete revolution in design. And here it is—

The 'British' ADJUSTABLE TIP-UP FRAME

PATENT APPLIED FOR

Special quotations for quantities

FINGER-TIP CONTROL— REVOLUTIONARY DESIGN!

A slight lift and the top light raises and slides gently into position behind the rear wall of the frame where it remains automatically locked. A clearance of only 2½ inches is needed between rows of frames to accommodate the opening lights. Easily adaptable for use as continuous frames. No wires, slides or hinges to corrode or stick. Built to last a lifetime. Size 6 ft. × 4 ft.

PRICE, each *Carriage Extra* **£10.10.0**

WRITE TODAY FOR DESCRIPTIVE LITERATURE TO SOLE MANUFACTURERS AND DISTRIBUTORS

The ADJUSTABLE PATENT CLOCHE Co.

(W. E. BURKIN, F.R.H.S.), THE BROADWAY, HANWELL, LONDON, W.7. Telephone: EALING 4838

WINKFIELD MANOR NURSERIES, ASCOT

BERKSHIRE

Fruit Trees, Ornamental Trees, Shrubs, Roses, Rhododendrons, Azaleas, Herbaceous & Alpines

HIGHEST QUALITY STOCK ONLY — Special Quotations for Quantity

ROCK PLANTS. For Sunny Walls, Paving and Steps we offer Special Collections. 12 plants for 16/6, 25 for 30/–, 50 for 60/–, 100 for 110/–. Rare varieties, 12 Plants for 25/6, 25 for 50/–. All labelled and different, well rooted ex pots.

FLOWERING SHRUBS. We have a wide selection of pot-grown Shrubs including:

Azara Microphylla: the small yellow March flowers diffuse a delightful perfume. 2–3 ft. 5/–, 3–4 ft. 6/–.

Cistus corbariensis: white flowers marked yellow. 1½–2 ft. 4/– to 5/–.

Chinese Winter Sweet: fragrant pale yellow flowers in Winter. 12–18 in. in 5¼ pots, 5/6 to 6/6.

Ceanothus in var.: lovely shrubs producing masses of flowers from April to July. 5/– to 8/–.

Choisya ternata: evergreen foliage and fragrant white flowers. 1–2 ft. 5/6 to 7/6.

Escallonias in var.: elegant South American evergreens flowering from June to October. 4/6 to 5/6.

Hydrangea Hortensis: pink, white and blue flowers. 4/6 to 6/–.

Pittosporum tenuifolium: decorative foliage. 12–18 in. 4/– to 5/–.

Veronicas in var.: these pretty sun-loving plants thrive well. 3/– to 5/–.

Orders under £1 please add 2/6; over £1 at cost.

62-page General Catalogue and 38-page Herbaceous and Rock Plant Coloured Catalogue free.

WINKFIELD MANOR NURSERIES, ASCOT

Winkfield Row 3112

Architects and Constructors of Rock and Formal Gardens, Swimming Pools and Labourless All-weather Tennis Courts, which require neither watering nor rolling

4 Chelsea Gold Medals since 1947

Extracts from
THE PROCEEDINGS OF
THE ROYAL HORTICULTURAL SOCIETY

GENERAL MEETINGS

NOVEMBER 1, 1949

SCIENTIFIC COMMITTEE—Mr. E. A. Bowles, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and nine other members present.

Scilla Tubergeniana seeding. Mr. Stearn drew attention to the form of the caruncle of the seed of *Scilla Tubergeniana* which was much larger than that of related species such as *S. sibirica*. The soft tissues of the caruncle are eaten by ants which in the process are apt to distribute the seeds. *S. Tubergeniana* rarely seeds in English gardens, apparently owing to weather conditions at flowering time, but Mr. Hoog has pointed out that bulbs planted and flowering late set seed freely, which Mr. Stearn has confirmed.

Aerial corm of Gladiolus—Mr. Balfour showed a Gladiolus plant with a well-developed corm about 1 inch in diameter in the axil of a leaf about 8 inches above ground; the new corm at the base had also developed well, and probably some obstruction in the vascular tissue of the stem just below the leaf subtending the aerial corm had led to accumulation of food at that place, and the formation of the corm to accommodate it.

Hygroscopic awn of Pulsatilla—A letter from Mr. H. W. Mallpress of Parkways, Welwyn Garden City, was read, in which he drew attention to the hygroscopic awn of *Pulsatilla vulgaris* (*Anemone Pulsatilla*). The seed was sown in a tray with the awn above the soil. He wrote, "One day when sprinkling the seed tray with a fine rose on the watering can, I noticed movement of the awns, which were now bent or leaning, and on observing them closely noticed they were slowly revolving in a manner that reminded me of the distributing arms on a sewage bed. The motion was clockwise and I estimated it took about 3 seconds for each to make a complete circular movement. About half-a-dozen complete circles were made before the motion ceased." This movement occurred each time the tray was sprinkled.

FRUIT AND VEGETABLE COMMITTEE—Mr. F. A. Secrett, C.B.E., F.L.S., V.M.H., in the Chair, and seventeen other members present.

Exhibits

Awards Recommended:

Gold Medal

To H. H. Crane, Esq., F.L.S., Highmead, Cheney Lane, Eastcote, Pinner, Middlesex, for a group of Apples and Pears (votes 17 for, 1 against).

Hogg Medal

To Winkfield Manor Nurseries, Ascot, Berks., for a group of Apples.

Selected for trial

Apple Seedling, from J. B. Wager, Esq., Ivy Cottage, Catteshall Lane, Godalming, Surrey.

Other Exhibits

Apple Seedling, from Mrs. L. A. B. Satterthwaite, 16 Ravenscroft Park, High Barnet, Herts.

Pear Seedling, from W. Ferguson, Esq., The Manse, Ballygoney, Moneymore, County Derry, N. Ireland.

Apple Seedling, from Messrs. Pennell & Sons, Ltd., 312 High Street, Lincoln.

Apple Seedling, from Colonel R. B. Phayre, M.C., F.L.S., Collatons House, Bow, Crediton, Devon.

Apple Seedling, from G. W. Dalman, Esq., 23 Hill View Crescent, Guildford, Surrey.

Apple Seedling, from C. Sampson, Esq., The Orchard, Common Road, Snettisham, Norfolk.

Apple Seedling, from W. G. Perkins, Esq., Crossways House, Hereford Road, Great Amwell, Ware, Herts.

FLORAL COMMITTEE A—Mr. G. W. Leak, V.M.H., in the Chair, and thirteen other members present.

Awards Recommended:

Gold Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of Carnations.

Silver-gilt Banksian Medal
To Messrs. C. Engelmann, Ltd., Saffron Walden, for an exhibit of Carnations.
To Messrs. Sutton & Sons, Ltd., Reading, for an exhibit of 'Cascade' and 'Charm' Chrysanthemums.
To Messrs. A. G. Vinten, Ltd., Balcombe, for an exhibit of Chrysanthemums.

Silver Flora Medal
To Mr. J. R. Bell, Cross in Hand, for an exhibit of Chrysanthemums.
To Messrs. Blackmore & Langdon, Bath, for an exhibit of Cyclamen.
To the Borough of Malden & Coombe, New Malden, for an exhibit of Chrysanthemums.
To Mr. Th. C. Nieuwenhuizen, Aalsmeer, Holland, for an exhibit of Carnations.

Silver Banksian Medal
To Messrs. Anjerkweekerij', T. Clooster, Heemstede, Holland, for an exhibit of Chrysanthemums.
To Messrs. Napier, Ltd., Taunton, for an exhibit of Chrysanthemums.

Flora Medal
To the Orpington Nurseries Co., Ltd., Orpington, for an exhibit of Korean Chrysanthemums.

Banksian Medal
To Mr. A. Miles, Bickley, for an exhibit of Korean Chrysanthemums.

Award of Merit
To Chrysanthemum 'Cambria,' as a variety for exhibition (votes 10 for, 3 against), from Colham Green Nurseries, Ltd., Hillingdon.
To Chrysanthemum 'Winn Quinn,' as a variety for exhibition (votes 13 for, 0 against), from Colham Green Nurseries, Ltd., Hillingdon.
To Nerine 'Stephanie,' as a cool greenhouse flowering bulbous plant (votes 10 for, 0 against), from Col. S. R. Clarke, M.P. (gardener Mr. W. Fleming), Borde Hill, Haywards Heath.

Other Exhibits
Nerine 'Mrs. Clarke,' from Col. R. S. Clarke, M.P., Haywards Heath.
Violas and Roses, from Mr. C. A. Jardine, Feltham.

FLORAL COMMITTEE B—Lord ABERCONWAY, C.B.E., LL.D., V.M.H., in the Chair, and thirteen other members present.

Awards Recommended:

Silver Flora Medal
To Messrs. Hillier & Sons, Winchester, for an exhibit of ornamental-foliaged shrubs and trees.

Silver Banksian Medal
To Mr. J. Hogger, Felbridge, for an exhibit of conifers.
To Messrs. D. Stewart & Sons, Ltd., Ferndown, for an exhibit of ornamental-foliaged and berried shrubs and trees.
To Winkfield Manor Nurseries, Ascot, for an exhibit of rock-garden plants and shrubs.
To Messrs. Wm. Wood & Son, Ltd., Taplow, for an exhibit of herbs and aromatic plants.

Flora Medal
To Messrs. Burkwood & Skipwith, Ltd., Kingston, for an exhibit of ornamental-foliaged and berried shrubs.

Banksian Medal
To Messrs. G. & A. Clark, Ltd., Dover, for an exhibit of berried shrubs and hardy flowers.
To Kew Topiary Nurseries, Richmond, for an exhibit of clipped Box trees.

Award of Merit
To *Euonymus europaeus* 'Red Cascade,' as a hardy, ornamental-berried shrub (votes 9 for, 0 against), from Messrs. George Jackman & Son (Woking Nurseries), Ltd., Woking.

Other Exhibits
Arbutus Unedo rubra, *Ruta graveolens* 'Jackman's Blue,' exhibited by Messrs. George Jackman & Son (Woking Nurseries), Ltd., Woking, Surrey.
Conifers, exhibited by Mr. S. Sims, Draycott.
Elaeagnus macrophylla, exhibited by Mrs. Gwendolyn Anley, Woking.
Gentians, exhibited by Mr. C. Newberry, Knebworth.
Miniature Gardens, exhibited by Long Barn Gardens, Harlow.

JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

Vol. LXXV Part 3

March 1950

THE SECRETARY'S PAGE

ANNOUNCEMENTS—MARCH AND APRIL

Shows, Lectures and Meetings

TUESDAY, MARCH 7. 12 NOON TO 6 P.M. First day of Show.
3 P.M. LECTURE: *Cool Greenhouse Orchids and Methods of Cultivation for the Week-end and Evening Gardener* by MR. D. F. SANDER.

WEDNESDAY, MARCH 8. 10 A.M. TO 5 P.M. Second day of Show.

TUESDAY, MARCH 21. 12 NOON TO 6 P.M. First day of Show.
Daffodil Competition.
McBean Memorial Trophy Competition for Cymbidiums.
Alpine Garden Society's Competition.
3 P.M. LECTURE: *Rock Garden Plants* by MR. W. G. MACKENZIE.

WEDNESDAY, MARCH 22. 10 A.M. TO 5 P.M. Second day of Show.

TUESDAY, APRIL 4. 12 NOON TO 7 P.M. First day of Show.
Camellia and Magnolia Competition.
2.30 P.M. First day of Camellia and Magnolia Conference.

WEDNESDAY, APRIL 5. 10 A.M. TO 5 P.M. Second day of Show.
10.30 A.M. / 2.30 P.M. Second day of Camellia and Magnolia Conference.

THURSDAY, APRIL 13. 12.30 P.M. TO 7 P.M. First day of Daffodil Show.
First day of British National Carnation Society's Spring Show.
3 P.M. LECTURE: *Points of a Good Daffodil and how to stage Daffodils for Exhibition* by MAJOR C. B. HABERSHON.

Shows, Lectures and Meetings—*cont.*

FRIDAY, APRIL 14. 10 A.M. TO 5 P.M. Second day of Daffodil Show.
Second day of British National Carnation Society's Spring Show.

TUESDAY, APRIL 18. 12 NOON TO 7 P.M. First day of Show. Sewell Medal Competition for Alpines for Amateurs.
3 P.M. LECTURE: *Architecture in Relation to Gardens* by MR. G. P. YOUNGMAN, A.I.L.A., A.M.T.P.I.

WEDNESDAY, APRIL 19. 10 A.M. TO 5 P.M. Second day of Show.

TUESDAY, APRIL 25. 12 NOON TO 7 P.M. } Alpine Garden
WEDNESDAY, APRIL 26. 10 A.M. TO 5 P.M. } Society's Show.

Demonstrations at Wisley—The following demonstrations will be given at Wisley, that on the second day being a repetition of the demonstration given on the first:—

Flower Garden

March 8, 9. Pruning of Roses and Shrubs. (2–4 P.M.)
March 15, 16. Seed Sowing and Vegetative Propagation of Alpines (2–4 P.M.)

Fruit Garden

March 22, 23. Spring Spraying of Fruit Trees. (2–4 P.M.)

Opening of Shows—The Council has decided that as an experiment during the period of summer time this year the Society's Shows shall remain open on the first day of each Fortnightly Show until 7 P.M. This is to give an opportunity of seeing the Show to those Fellows and others living in London who cannot get away from their offices in time to see the Show before 6 P.M. This experiment will be carefully watched to see whether the response is sufficient to justify the same arrangement in future years.

Publications—*New Plants of the Year* 1949 will be ready early in March. This contains descriptions of all plants which received awards at Vincent Square or after trial at Wisley during 1949 and is illustrated both in colour and in monochrome. It is thought that this volume should be of special value to overseas Fellows and those who are not able to visit the Shows. It may be obtained on application to the Secretary, price 12*s.* 6*d.* plus postage and packing 9*d.* There are still copies available of *New Plants of the Year* 1948 and copies of this can be supplied together with the 1949 volume at the inclusive price of £1, postage 1*s.*

CAMELLIA AND MAGNOLIA CONFERENCE, 1950

THIS Conference will be held in the Lecture Room of the Society's New Hall, Greycoat Street, Westminster, on April 4 and 5, 1950. On each of these days experts will give papers in the Lecture Room, particulars of which are given below. A two-day Show will be held concurrently with the Conference at which displays of Camellias and Magnolias will be a special feature. The Conference will be organized on the same lines as the Rhododendron Conference and it is hoped that it may be attended by enthusiasts on Camellias and Magnolias from all over the world.

On March 31 and April 1 there will be day-excursions to outstanding gardens in the vicinity of London where there are collections of these two genera. A six-day tour by motor-coach has also been arranged, starting March 21, visiting Cornish gardens renowned for their collections of Camellias and Magnolias. The party will proceed by train to Falmouth.

The following programme has been arranged and further particulars may be obtained on application to the Secretary. Early application for places on the tours is necessary.

PAPERS TO BE GIVEN AT THE CONFERENCE

Tuesday, April 4, 1950

Chairman

The President of the Royal Horticultural Society

2.30 P.M. "Camellias in Cornish Gardens": a film with commentary by MR. G. H. JOHNSTONE, O.B.E., and DR. W. L. STEWART.

"The varieties of *Camellia reticulata* in Yunnan" by MR. T. T. YÜ (A brief summary only with lantern slides will be given.)

followed by—

"Forms of *Camellia japonica*" by DR. H. HAROLD HUME, (President-Emeritus of the American Camellia Society).

Wednesday, April 5, 1950

10.30 A.M. "Propagation of Camellias and Magnolias" by MR. H. G. HILLIER.

followed by—

"Survey of the Genus Magnolia together with Michelia and Manglietia" by MR. J. E. DANDY, M.A., F.L.S. (Department of Botany, British Museum (Natural History)).

2.30 P.M. "Chinese Magnolias in Cultivation" by MR. G. H. JOHNSTONE, O.B.E.

followed by—

"Camellia Species" by MR. J. R. SEALY, B.SC., F.L.S. (Royal Botanic Gardens, Kew).

DAY EXCURSIONS

Friday, March 31, 1950	Visit to Tittenhurst, Sunninghill (property of MRS. D. MOSENTHAL), to the Royal Horticultural Society's Gardens, Wisley, and to the Royal Botanic Gardens, Kew.
Saturday, April 1, 1950	Visit to Nymans, Handcross (property of LIEUT.-COL. L. C. R. MESSEL, O.B.E., F.L.S., V.M.H.), and to Borde Hill, Haywards Heath (property of COL. R. S. CLARKE, M.P.).

SIX-DAY TOUR BY MOTOR COACH VISITING CORNISH GARDENS RENOWNED FOR THEIR COLLECTIONS OF CAMELLIAS AND MAGNOLIAS

Saturday, March 25	London—Falmouth (train.)
Sunday, March 26	Visit to Trewithen, Grampound Road (property of G. H. JOHNSTONE, ESQ., O.B.E.) and to Scorrier House, Scorrier (property of MRS. F. WILLIAMS).
Monday, March 27	Visit to Tregothnan, Truro (property of VISCOUNT FALMOUTH) and to Heligan, St Austell (property of CMDR. H. H. THOMAS).
Tuesday, March 28	Visit to the Truro Flower Show and to Caerhays Castle, Gorran (property of CHARLES WILLIAMS, ESQ., M.P.).
Wednesday, March 29.	Visit to Lanarth, St Keverne (property of M. P. WILLIAMS, ESQ., M.B.E.), to Trewidden, Buryas Bridge, Penzance (property of MRS. CHARLES WILLIAMS), and to Trengwainton, PENZANCE (property of COL. E. H. W. BOLITHO, D.S.O.).
Thursday, March 30	Return to London (train).

The inclusive charge for this tour will be £18 6*s*. 6*d*.

This Tour has been planned in order to supply information to those actively engaged in the study or raising of Camellias and Magnolias and will necessarily be concentrated and therefore strenuous. Owing to the limited number of places, the Council of the Society reserves the right to use its discretion in the allocation of vacancies, and Fellows are asked to abide by the Council's decision.

All arrangements for the Tour have been placed in the hands of MESSRS. THOS. COOK & SON, to whom applications will be forwarded in due course, and with whom all correspondence regarding details of the Tour should be conducted.

WISLEY IN MARCH

EARLY in the year it is the bulbous plants which are outstanding, providing a welcome display of colour in the garden. Their carefully stored food supply and already-formed flower buds give them an advantage over their fellows. Down the old Apple walk which runs parallel to the herbaceous borders is stretched a multicoloured ribbon of orange, purple and white Dutch Crocuses. They have been established here for many years, never failing to produce a wealth of bold satiny flowers. Among many others, 'The Bishop' and 'Gladstone' are two popular purple varieties, while 'Striped Beauty' has ashy grey flowers overlaid with mauve. Bordering the gravel path *Bergenia cordifolia*, once known as *Saxifraga cordifolia*, is throwing up dense pink flower-heads above the fleshy green leaves.

Entering Seven Acres the border on the right of the path is densely carpeted with the brilliant sky-blue stars of *Chionodoxa Luciliae*. Scattered throughout the borders are vivid patches of yellow created by the Forsythias. *F. ovata* is the earliest to flower and only grows to about 4 feet in height. Following this Korean species come *F. Giraldiana*, *F. suspensa* and *F. intermedia* var. *spectabilis*. To keep them in a free-flowering condition some of the old wood should be pruned away each year directly after flowering. In the border on the north-west side of Seven Acres, backing on the river, there is a shapely plant of *Osmanthus Delavayi* with small white, sweetly scented flowers.

The Heath Garden is becoming steadily more colourful as the varieties of *Erica carnea* come more strongly into bloom. There are numerous named varities such as 'Thomas Kingscote,' 'Winter Beauty' and 'Pink Beauty', all of varying shades of pink.

In the Wild Garden three species of the evergreen shrubby genus Pieris will be flowering late in the month, *P. floribunda* from North America, *P. taiwanensis* from Formosa and *P. japonica*; all three bear panicles of white urceolate flowers. Sheets of golden yellow are quickly being spread under the trees and along the ditches as the flowers of *Narcissus cyclamineus* again paint one of the pictures for which Wisley is famed. On the south side of the glade and elsewhere are a number of large old plants of varieties of *Camellia japonica*, single and double, in shades of pink, crimson and white.

At the end of this month and the beginning of April a conference on Camellias and Magnolias is being organized by the Society in connection with which, on March 31, a visit will be paid to the Gardens; a note on these plants may therefore be of interest.

In the middle of the nineteenth century, Camellias were perhaps the most popular greenhouse plants in this country, the form of the old varieties being well illustrated by the coloured plates in CHANDLER AND BOOTH'S *Monograph* published in 1831. At the turn of the century their popularity rapidly declined, but now interest is again being taken in them, this time as spring-flowering shrubs to be grown in the open against a wall or under the shade of trees. *C. japonica* was the first of the genus to be introduced, being cultivated in 1739 by ROBERT JAMES, LORD PETRE as a stove plant. It was from this species that all the English-raised varieties were derived in the early days. Some few years ago it

was crossed with *C. saluenensis*, a plant introduced from mid-west Yunnan by FORREST in 1917, the group of hybrids from this cross being named *C.* × *Williamsii* (see R.H.S. JOURNAL, vol. LXXIV, 346 (1949)) in honour of their raiser, MR. J. C. WILLIAMS. Several varieties have been separated, the most notable being 'J. C. Williams' itself and the darker pink 'Mary Christian.' Visitors can see these varieties flowering on Battleston Hill. Another species of real garden value is *C. reticulata*. The wild form was introduced from Yunnan by FORREST, but it has been represented in England ever since 1820 by a double-flowered form from Chinese gardens which was introduced by CAPTAIN RAWES of the East India Company. Many other varieties are cultivated in Yunnan, where it is the "national" flower, and efforts are now being made to introduce a selection of these to American and British gardens.

In the Magnolias we have some really first-class garden plants, the only disadvantage being the length of time many of them need before they will flower. *M. stellata* is the exception, flowering when only a few feet high. Growing slowly at first, but eventually making a small tree, it is a native of Japan, abounding in the woods on Mount Fujiyama. There are several specimens in the Gardens which should be flowering later this month, one of them being planted in the dell on Battleston Hill. On Weather Hill a shapely tree of *M. Kobus* will also be flowering. Nearby is the variety *borealis*, which is larger and hardier than the type but does not reach flowering condition so soon. In April *M.* × *Soulangiana* will begin to bloom. This plant, and its numerous varieties, is probably the most popular. The original hybrid was raised in the garden of Chevalier Soulange Bodin, an officer of the French Army, at Fromont near Paris, *M. denudata* being fertilized with pollen from *M. liliflora*.

On the Rock Garden are patches of Snowdrops and Snowflakes and several Primulas, such as *P. rosea*, *P. elatior* and *P. frondosa*. The dark green leaves of the truly carpeting *Saxifraga oppositifolia* are studded with stemless mauve flowers. It is planted here at the head of the scree, while in the moist soil on the edge of the highest pond the double variety of the Marsh Marigold flourishes. To the left of the steps to the Alpine House grows a beautiful plant of similar colouring, *Erythronium tuolumnense*, with flowers like a miniature Turk's Cap Lily.

In the beds outside the Alpine House the collection of hybrids and varieties of Waterlily Tulips, *T. Kaufmanniana*, open their colourful, almost stemless flowers in the sun.

Walking along the path in the direction of the Alpine Meadow one passes the bi-generic hybrid × *Chionoscilla Allenii* on the very fringe of the meadow. The meadow itself is scattered with thousands of Hoop-Petticoat Daffodils, one of the finest spring displays in the Gardens. The path now runs along the edge of the Wild Garden where the Dog's Tooth Violet flourishes along with Chionodoxas on a dry mound to the left of the path.

In the Temperate House the plants in flower will be little different from those mentioned last month beyond the addition of such Rhododendrons as *R. inaequale*, *R. ciliicalyx* and *R. bullatum*.

NOTES ON A FEW PLANTS FROM S.E. TIBET

George Taylor, D.Sc.

THE tract of the Himalaya which thrusts into the bend of the Tsangpo is the home of many very lovely plants, and of these the members of the genus *Primula* are specially noteworthy. It is unfortunate, however, that so many of them are tantalizingly obdurate in their refusal to accept this country as a home. In this category are four representatives of the *Amethystina* section which LUDLOW, SHERRIFF and I collected in 1938—*P. Dickieana*, *P. Kingii*, *P. odontica* and *P. Valentiniana*—and which are surely amongst the most attractive of plants. Their usual transitory appearances in gardens in this country have given a very inadequate idea of their loveliness. They are all species apparently exacting in their requirements, for they enjoy continuous rain or constant mist baths for several weeks during the growing season and are wrapped in a deep blanket of snow in the winter. It would be difficult to reproduce such conditions in this country, and, were it possible, there are probably other factors to be resolved before the plants could be acclimatized. Certainly there is scope for research to discover the needs of these plants, but material for experiment is unfortunately very scarce and they will probably continue to frustrate gardeners by their capriciousness.

The three species *P. Kingii*, *P. odontica* and *P. Valentiniana* are closely related. All are gregarious, of neat habit and with nodding, bell-shaped flowers of a deep claret or wine-crimson tone, and they occur in lavish profusion and stain the alpine slopes with their rich hues. *P. Kingii* and *P. odontica* have flowered in cultivation, but *P. Valentiniana*, although it has been raised from seed several times and live plants have been brought home, has not yet been brought to maturity.* At present there are robust seedlings in many gardens, raised from seed sent home in 1948 by LUDLOW, SHERRIFF and ELLIOT under No. 13285A collected on the Doshong La. It is much to be hoped that this delightful little plant will become established in cultivation.

This year (1949) *P. Dickieana* has flowered in cultivation for the first time, from seed collected by LUDLOW, SHERRIFF and ELLIOT, under No. 13285, from the Lusha La. MR. AND MRS. J. RENTON of Branklyn, Perth, succeeded in flowering about forty plants, and sent several to London, though, unfortunately, they did not arrive in good enough condition to be shown. One of the plants raised at Perth is portrayed at Fig. 41.

P. Dickieana is a somewhat isolated member of the section *Amethystina*. In this section the flowers are generally campanulate and pendulous, but in *P. Dickieana* they do not droop; the narrow corolla-tube expands slightly beyond the calyx and the cleft corolla-lobes spread in a slightly oblique plane. The throat of the corolla is more or less closed by hairs. The specimens which flowered in Perth had lavender-violet

* In October, 1949, a plant raised from seed sent under No. *L. S. & E.* 13285A, flowered at the Royal Botanic Garden, Edinburgh, but the specimen gave a grossly inadequate idea of the real beauty of the species.

(H.C.C. 637) corolla-lobes, each with a chocolate-brown spot near the base and the centre of the flower had a five-lobed orange-yellow "eye".

There is, however, a wide range in colour in the species. One day on the south side of the Doshong La I came to a swamp—probably the same as that described by KINGDON-WARD on p. 114 of his *Riddle of the Tsangpo Gorges*—covered with masses of *P. Dickieana* in which it was possible to pick out four distinct colour forms. There was the most usual one in which the corolla segments were magenta to violet-purple. Another form had dull lilac-white corolla lobes with a diffused brown area towards the base and an orange eye. A third form had white lobes with an orange-yellow eye, and in a fourth the segments were pale buff diffusing to orange in the centre. I collected as many plants of each as could be carried with the other trophies of the day, and back in camp arranged them in front of the tent. The photograph at Fig. 42 shows the assortment. The range of colour cannot properly be appreciated in monochrome, but the variation in the "eye" markings is fairly clear.

The day on which we crossed the Doshong La into Pemako was one of the most memorable of the whole expedition and yielded a magnificent lot of plants which, at the height of the monsoon season, taxed the drying facilities to the limit. It was a day of lashing rain and driving mist, and the hillsides were streaked with foaming white torrents; the track to the summit of the Doshong La was now a torrential stream. On the way to the pass over the moorland we had often to wade through pools up to our knees. The Primulas and Rhododendrons in great profusion were magnificent: the cleansing rain seemed to intensify their brilliant colours. Over acres, the dark crimson bells of *P. Valentiniana* appeared to nod everywhere in the moorland clearings between huge cushions of dwarf Rhododendrons, but large colonies of other species made bold patches of colour. In bog hollows the nivalid *P. falcifolia* was conspicuous, and it grew in quantity along the watercourses. This is a very choice plant. From an attractive basal rosette the flowering stem bears 1–4 lovely pendent fragrant flowers with a lemon-yellow corolla, sometimes flushed deep apricot to brick-red on the reverse. Here and there *P. chionota* formed vigorous clumps on the hillsides, its flowers varying from primrose-yellow to deep magenta-purple. *P. Morsheadiana* was another common species. The most conspicuous Rhododendrons on the open moorland were *R. crebriflorum*, *R. mekongense*, *R. campylocarpum*, *R. Forrestii* and *R. paludosum*.

One of the loveliest alpines I know—*Diapensia Wardii*—was flowering beautifully (Fig. 48). This species surely combines all the attributes of an ideal alpine, and it is a great pity that it was never raised from our seed. It is not a common plant on the Doshong La—it was much more abundant on the Bimbi La, whence most of our seed came—but its rich rose-pink flowers borne on slender crimson pedicels were very conspicuous, and its congested habit with the branches closely covered with neat, shiny, evergreen, leaves makes it a most attractive plant.

On the summit of the Pass (17,500 ft.) we were met by terrific wind which drove the rain and sleet with merciless fury. We dropped quickly

down the south side to a small amphitheatre with the floor covered with huge boulders which just protruded from the snow. Then followed a steep rocky descent into a second cirque with the bottom formed of deep compressed snow, brought down and impounded by successive avalanches. At places, where this platform had collapsed by the action of hidden streams, sections of stratified snow as much as 20 feet in depth were revealed. The snow on the upper slopes was corniced and weathered into weird shapes. Where the hillsides were free from snow there was a covering of Rhododendrons, though only *R. cerasinum* was in flower with dazzling waxy crimson blossoms, each with five dark nectar pouches. From the second shelf we descended to a third, again covered with avalanche snow and enclosed by a steep amphitheatre of mountains. From the high rocks long white cascades poured into space to become dispersed in drifting spray clouds. Lastly, we descended to the swampy valley floor which was covered with a tangle of willows, *Lonicera* and *Rhododendron charitopes*. Between these shrubs grew a beautiful form of *Meconopsis simplicifolia* and an *Arisaema* with a crimson clubbed spadix protruding from a dull green spathe. On the hillside here, at about 12,500 feet, there was a profusion of a most striking plant—*Strobilanthes oresbius*—with long panicles of brilliant purple-mauve flowers. It grew up to 6 feet in height and made a lovely natural herbaceous border on each side of the narrow track. It was near here, on damp flats by the stream, that we came to abundance of *P. Dickieana* in its variety of colour forms.

Although Rhododendrons, in a medley of colour, dominate the high sodden moorlands, screes and avalanche slopes in the Tibetan Himalaya, other dwarf shrubs, such as species of *Berberis*, *Potentilla*, *Lonicera*, *Cassiope*, *Gaultheria*, *Vaccinium*, *Diplarche** (Fig. 46), *Salix* and *Juniperus*, mingle in the matted alpine scrub, and most of these are of considerable horticultural merit.

The evergreen Cassiopes are especially attractive, and by their stoloniferous habit spread and carpet acres of the open moorland and rocky hillsides, much in the same way as heather does in this country. With their myriads of dainty, white, pendent bells they are one of the chief glories of the Tibetan Himalaya. The erect fastigiate branches, clothed with closely imbricated leaves, give the plants rather a quaint appearance.

In 1938 we collected four species of *Cassiope*—*C. fastigiata*, *C. pectinata*, *C. selaginoides* and *C. Wardii*—and, with the exception of *C. pectinata*, seed was obtained of all (Fig. 43). Apparently little success attended the efforts to introduce these plants and only a few plants of *C. Wardii* have survived. It is the most robust species and should grow well in a cool, moist, peaty corner where its stolons can spread. One specimen, originally raised from the 1938 seed by MR. and MRS. RENTON, has attracted a good deal of attention during recent years when shown by MR. R. B. COOKE at alpine shows around the country

* *Diplarche multiflora* is a lovely little ericaceous shrub, and the nearest approach to a Heath to be found in the Himalayas. It somewhat resembles *Erica carnea* in habit. Successive importations of seeds have not produced plants, but recently LUDLOW and SHERRIFF sent home two clumps by air from Bhutan, and these, it is hoped, will become established and be distributed.

(Fig. 44). It is a magnificent plant with attractively whiskered leaves and, among other distinctions, gained the Award of Merit on May 3, 1949. Plants of *C. Wardii* have been raised from seed sent home last year by LUDLOW and SHERRIFF, and it is to be hoped that the plant will become widely established and better known in gardens.

C. Wardii was described from specimens collected by KINGDON-WARD on the Temo La and the neighbouring Nyima La in 1924. We visited these passes, which cross the mountains north of the Tsangpo in the province of Kongbo, in 1938 and collected further material of the plant. But the species also grows on the main Himalaya and in magnificent profusion covers loose gravel banks, rock shelves, avalanche slopes and seeping screes on the Lusha La, the Tamnyen La and above Tripe. The original plants in cultivation, one of which received the Award of Merit, were raised from seed collected (under LUDLOW, SHERRIFF and TAYLOR 4734A) above Tripe on south-facing slopes where it grew with the amazing assemblage of beautiful species which I briefly described in a previous article (R.H.S. JOURNAL, vol. LXXII, 143–144 (1947)).

One of the finest introductions to gardens in recent years has been the Tibetan form of *Paeonia lutea*, which is locally abundant on gravel terraces in the lower Tsangpo valley and in the dry transitional zone in other parts of south-eastern Tibet. In habit, and in certain floral details, the plant diverges from typical *P. lutea*, a species of Yunnan and south-western China, and a critical assessment of these differences suggests that the two plants deserve separate taxonomic rank. Another Peony from the lower Tsangpo has now appeared in cultivation and may reach maturity during next season. This species is *P. Mairei*. In 1938 we made several gatherings of this plant, but the flowers were over and we only saw the fruits—bright scarlet gaping follicles revealing indigo-blue seeds. These seeds, sent home under No. 5350A, apparently did not germinate. The local Tibetans knew the plant under the name *kogo meto*, and they said that it had white flowers. It is 2–3 feet in height and grows in dry stony situations between 9,300 and 11,500 ft., sometimes in the dense shade of the evergreen oak forest, or in clearings amongst shrubs.

Thus, in 1947, LUDLOW, SHERRIFF and ELLIOT were anxious to rediscover the Peony, and they succeeded in this and secured an ample supply. The species flowers early in Tibet, towards the end of April, and seeds from which plants have been raised were harvested in August under No. 14231 (Fig. 45). *P. Mairei* was originally described by LÉVEILLÉ from specimens collected by MAIRE in Yunnan, and it is also found in Szechuan. The records from south-eastern Tibet represent a notable extension in its geographical range, and are another example of the close relationship between the flora of south-western China and south-eastern Tibet.

P. Mairei should be an interesting addition to the species population of our gardens, but it is doubtful whether it will find so much favour as its distinguished Tibetan neighbour at present grown as *P. lutea*.

THE PRODUCTION OF QUALITY IN APPLES

Professor T. Wallace, C.B.E., M.C., D.Sc., F.R.I.C.
DIRECTOR, LONG ASHTON RESEARCH STATION

(*Lecture given* 29 *November* 1929, DR. H. V. TAYLOR, C.B.E., D.SC., V.M.H., *in the Chair*)

AT the outset of this lecture it seems desirable to define the term quality as applied to Apples. In my own mind I associate the following characters of the fruits with quality and it is these that I propose to discuss to-day in relation to factors concerned in production.

a. Physical and chemical properties of the fruits which make them pleasing to the eye and to the palate. These include the following:

(i) *Physical:* size, shape, colour of skin and of flesh, firmness, texture of flesh (*i.e.*, crispness and juiciness to palate).

(ii) *Chemical:* contents of dry matter, nitrogenous compounds, acids, sugars, tannins, aromatic compounds (giving particular flavours); ash and ash constituents.

b. Physiological characters determining storage changes and keeping properties.

c. Freedom from pests and disease organisms—affecting, in particular, appearance and storage properties.

FACTORS DETERMINING QUALITY

The factors that determine quality may be grouped under the following headings:

a. Materials: factors inherent to the trees—including varietal characters, rootstock characters and the effects of rootstocks on the scion varieties; age of tree; health of tree, in particular its freedom from virus diseases.

b. Environment: factors external to the trees. These may be subdivided into three sub-groups.

(i) Natural conditions of the site—including the climatic factors of rainfall, temperature and sunshine; slope and exposure; the natural soil conditions; occurrence of parasitic organisms such as pests and fungi.

(ii) Management factors introduced by the grower. These include soil treatment—cultural operations and manurial practices; control of pests and fungal and bacterial organisms; manual operations on the tree, such as pruning, fruit thinning, bark ringing, and root pruning; time of picking.

(iii) Miscellaneous factors. Position of fruits on the tree—exposed and shaded fruits; position of fruits on the truss—terminal and lateral fruits; light and heavy crops; size of fruits.

Before discussing the effects of these individual factors on quality I would remind you that the ultimate quality of any crop is the result of the complex interaction of these orchard factors. Examples of such interactions will be given in the data presented.

In discussing aspects of quality it is, moreover, necessary to introduce certain terms in common usage to describe special "breakdown" conditions of fruits, due to abnormal physiological changes that occur both whilst the fruits are on the tree and during storage, associated with unsatisfactory quality.

The most important are: superficial skin scald, which refers to a browning of the skin; lenticel spotting, in which the lenticel areas break down and become brown, the condition usually being followed by invasion of breakdown areas by fungi; skin cracking and russeting; bitter pit and cork, which refer to brownish pitted areas in the flesh, either fairly superficial or scattered throughout the cortex; core flush, a browning of the core region; flesh breakdown, in which the cortex shows collapse and brown discoloration.

THE NATURE OF THE EFFECTS PRODUCED BY THE VARIOUS FACTORS

a. Materials

Varieties.—Each variety has its own peculiarities in respect to fruit quality in the same way that each possesses particular properties as regards vegetative characters and fruiting habits. Thus a variety may have special dessert or culinary properties, and it may be early or late and be a short or longer "keeper." Other varietal characters also affect problems concerned with quality, as, for example, growth habit of the trees, special climatic, soil and manurial requirements, particular susceptibility to pests and diseases and the reaction of the variety to control measures used against these organisms (*e.g.*, spray damage). Some of the ways in which varietal characters affect problems of quality are illustrated in discussing the effects of other factors below, but it may also be stated that varieties show wide differences as regards their susceptibilities to different physiological breakdowns. Thus Newton Wonder is very susceptible to bitter pit (Fig. 59) and to core flush during storage; Bismarck and Lane's Prince Albert to core flush (Fig. 55); Allington Pippin to lenticel spot; Bramley's Seedling and Cox's Orange Pippin to flesh breakdown (Fig. 56); Worcester Pearmain and Monarch are very resistant to flesh breakdown and core flush, and these troubles seldom appear even after prolonged storage periods.

Rootstocks.—Rootstocks are themselves distinct varieties and thus have their own peculiarities as regards reactions to soil conditions, requirements for mineral nutrients, etc. Thus Malling No. V rootstock may be cited as being very susceptible to potassium deficiency and Malling No. I to magnesium deficiency, which often means in practice that trees worked on these two rootstocks will give fruits with properties characteristic of these two deficiencies.

Rootstocks also produce special effects on scion varieties which greatly influence the properties of the fruits. The dwarfing rootstock

Malling No. IX, provides an outstanding example of such effects, the fruits associated with this rootstock tending to be large and to have especially high sugar content which makes them sweet to taste.

Tables I and II present data illustrating rootstock effects on storage quality and the chemical composition of fruits under different manurial treatments. In Table II it will be noted that the differences are only evident under the "manured" treatment and illustrate the differential reaction of two rootstocks to a given manurial treatment.

TABLE I

Showing Effects of Rootstocks and Manuring on the Development of Storage Breakdown (Flesh Breakdown and Core Flush) in Cold Store, 1° C. Season 1933. Variety Worcester Pearmain

Rootstock	Showing % Breakdown under Various Manurial Treatments				Totals of %s each Root-Stock	Totals as % of Lowest Total
	No Manure %	Nitrogen %	Potash %	Nitrogen and Potash %		
Malling, No. I	10	17	5	48	80	127
,, II	20	45	3	30	98	156
,, III	13	15	21	39	88	140
,, IV	7	43	38	44	132	210
,, V	7	34	3	35	79	125
,, VI	16	25	2	20	63	100
,, VII	8	30	41	79	158	251
Totals of %s each Treatment	81	209	113	293		
Totals as % of Lowest Total	100	258	140	364		

TABLE II

The Effect of Manuring on the Sucrose Content of Apples on different Rootstocks

Size Grade (large to small)	M. I.		M. V.		M. X.
	Manured % Sucrose	Unmanured % Sucrose	Manured % Sucrose	Unmanured % Sucrose	Manured % Sucrose
1	3·37	—	—	—	—
2	3·31	—	2·90	—	—
3	3·32	—	—	—	3·10
4	3·36	—	2·47	—	3·12
5	3·26	2·75	2·18	2·36	2·92
6	2·47	2·40	1·81	1·97	2·26

Age of tree.—The important point to note in respect of age is that young trees produce fruits with very special characters and that these "juvenile" properties change with increasing age. The most important points are that the fruits on the young trees are abnormally large in size, they show a very special feature in their chemical composition in that both nitrogen and cane sugar (sucrose) contents are high and the fruits have poor keeping properties, being highly susceptible to bitter pit, shrivelling and storage breakdowns.

TABLE III

Showing the Effect of Age of Apple Trees on the Contents of Nitrogen and Sucrose in the Fruit

Variety	Number of Years Planted	Nitrogen in Fresh Weight %	Sucrose in Fresh Weight %
Allington Pippin . .	3	0·0869	3·52
	5	0·0694	3·04
Worcester Pearmain . .	3	0·0797	2·58
	5	0·0572	2·10
Worcester Pearmain . .	5	0·0531	3·19
	20	0·0381	2·54
Newton Wonder . . .	3	0·0594	1·76
	5	0·0557	1·32
	10	0·0310	1·34

Virus diseases.—Certain virus diseases have been identified in Apples and it is likely that these will be largely transmitted by budding and grafting. Thus it is important that buds and grafts should only be taken from virus-free trees. An example of an Apple virus which prevents the normal development of the fruits and results in deformed and useless specimens is provided by "False Sting." (Fig. 51). An outstanding example in Pears is the virus causing the condition "Stony Pit." (Fig. 52).

b. Environment—Natural conditions of the site.

Climatic factors—Three factors of climate requiring discussion are rainfall, temperature and sunshine. In practice these factors are interrelated in the climatic complex, since low rainfall areas are usually those with plentiful sunshine and a tendency to high temperatures. In Britain, it is unusual for dessert Apples to be grown commercially where the annual rainfall exceeds 35 inches or north of the latitude of The Wash. Reference to a map published in the *Ministry of Agriculture Bulletin* 133, *Apples and Pears*, will show how the centres of dessert Apple growing, where presumably quality is high, are contained within the area bounded by the August isotherm 68° F., which strongly suggests that temperature and light conditions are limiting factors to the production of high quality Apples in areas when August temperatures are below this level.

Certain features of quality associated with seasons of high rainfall (and low sunshine) and high sunshine (with high temperatures) call for mention.

Where rainfall is high, scab is usually a very serious problem and failure to control this disease may result in small, poorly coloured, spotted and cracked fruits. The fruits are also generally acid to taste and of low sugar content. In contrast, when sunshine and temperatures are at a high level, appearance is good, colour is high and sugar content good. High temperatures may, however, be associated with various forms of injury and are probably largely responsible for these, *e.g.*, water core followed by flesh collapse usually near the calyx ends of fruits; cracking and russeting of the skin as in Edward VII, flesh browning on tree (James Grieve), corky conditions in the cortex (tree pit) as in Newton Wonder, brown spotting in coloured areas of highly coloured fruits (Worcester Pearmain).

Because of the large variations in climatic conditions in different seasons, substantial seasonal differences in quality occur in fruits at any given centre and these differences may be accompanied by large differences in the chemical composition and storage properties of the fruits. The relationships between seasonal conditions and storage properties are very complicated and it is difficult to forecast whether fruits will keep well or poorly in any season, due to the fact that both sunny and wet seasons are associated with special harmful effects. Examples of differences in composition between two seasons are given in Table IV.

TABLE IV

Showing Seasonal Effects on Composition of Apples—Variety Allington Pippin. Season 1931 dull and wet; 1933 hot and dry

Pruning Treatments	1931			1933		
	Dry Matter %	Acidity %	Total Sugars %	Dry Matter %	Acidity %	Total Sugars %
Spur Pruned, 3 Bud	13·4	0·73	10·23	17·5	1·175	12·20
,, ,, 5 Bud	13·5	0·75	10·29	17·0	1·065	12·26
Regulated pruning (*i.e.*, branch thinning)	11·9	0·72	9·41	16·0	0·940	11·48
,, ,, ,,	12·7	0·68	9·84	17·3	1·020	11·70
,, ,, ,,	13·0	0·60	9·80	17·4	1·105	13·06
,, ,, ,,	12·4	0·74	9·54	16·9	1·135	12·08
,, ,, ,,	13·0	0·71	10·04	16·1	1·075	11·60
,, ,, ,,	13·4	0·75	9·91	—	—	—
,, ,, ,,	13·4	0·80	10·01	—	—	—

Soil conditions—Apples are grown under a wide range of soil conditions where other conditions of the environment are favourable and many soil defects can be successfully overcome by special cultural and manurial practices. Extreme conditions in soils should be avoided,

however, whenever possible if the production of high quality Apples is to be attempted since, on unfavourable soils, production is likely to be both uncertain and expensive. Examples of difficult soils are: chalk soils, due to their highly calcareous nature, which is likely to induce iron deficiency chlorosis in the trees; strongly acid soils, on which mineral deficiencies are likely to be prevalent; coarse gravelly soils, which are liable to drought effects and on which fluctuations in quality are usually large and difficult to control; poorly drained clay soils, which are liable to produce crops of poor quality in wet seasons.

Occurrence of parasitic organisms—Certain pests and diseases are liable to be prevalent in certain districts, often associated with special climatic factors, and in such areas it may be almost impossible for the amateur to produce high quality fruits. Thus in high rainfall districts scab and canker may produce especially severe effects and the wet conditions may prevent the application of adequate control measures. Then in dry areas, pests, such as red spider and codling moth, may reach unmanageable proportions and ruin crops of potentially high quality.

Management Factors

Cultural systems—The main cultural systems used in Apple production comprise permanent grass cover, cultivation with annual cover crops and cultivation without special cover crops. In considering the effects of these systems it is necessary to examine them from their long range aspects as well as from their immediate effects. From the long range aspect it is important to note that a system of continuous cultivation over a period of years is likely to result in deterioration of the soil structure and general fertility, and thus to a lowering of fruit quality. These bad effects may be offset to some extent by practices which tend to replenish organic matter, *e.g.*, by the use of bulky organic manures, but unfortunately practices such as these tend to lower dessert quality. Annual cover crops tend to check the ill effects of continuous cultivation, but the system is often difficult to carry out under trees and where rainfall fluctuates from year to year. The best system to ensure high quality produce, excepting under very dry conditions, is undoubtedly the permanent grass cover, combined with suitable cutting treatment of the grass to ensure that it is always kept short. The main effects of this system on the nutrition of the tree, and hence on the fruit, are as follows: nitrogen is decreased, potassium and phosphorus may both be increased and defective iron nutrition may be corrected or substantially improved on calcareous soils. The effect on nitrogen level is of great importance as it allows the level to be adjusted as desired by means of nitrogenous fertilizers.

The main effects of a system of grass culture on fruit quality are as follows: size is generally reduced, shape may be improved by decreasing ridges around the calyx cup, firmness is increased, colour is improved by promoting a lighter ground colour and increasing flush, nitrogen content is decreased, acid may be increased, total sugars are

increased (except where grass effect is excessive), flavour is increased with increasing sugar content, storage properties are improved both as regards liability to rots and physiological breakdowns.

Examples of grass effect and of nitrogenous manuring on chemical composition and on storage properties of fruits are presented in Tables V, VI, VII and VIII.

TABLE V

Showing the Effect of Cultivation and of a Nitrogenous Fertilizer on the Chemical Composition of two Varieties of Apples

Variety	Treatment	Dry Matter %	Nitrogen in Fresh Weight %	Acid in Fresh Weight %	Reducing Sugars in Fresh Weight %	Sucrose in Fresh Weight %	Total Sugars in Fresh Weight %
Newton Wonder	Grass only	12·73	0·0299	0·544	8·60	1·27	9·87
	Grass + Nitrate of Soda at 5 cwt. per acre	14·10	0·0316	0·558	8·50	1·92	10·42
	Cultivation only	12·87	0·0441	0·479	8·06	1·60	9·66
Lord Grosvenor	Grass only	10·16	0·0255	0·607	7·16	0·63	7·79
	Grass + Nitrate of Soda at 5 cwt. per acre	10·24	0·0375	0·645	7·39	0·81	8·20
	Cultivation only	11·47	0·0484	0·604	7·17	0·70	7·87

TABLE VI

Showing the Effect of Cultivation and of a Nitrogenous Fertilizer on the Storage Quality of Apples—Variety Newton Wonder. Ordinary Store: 25/4/28; Cold Store: 19/6/28.

Treatment	% Breakdown (Core Flush)	
	Ordinary Store	Cold Store
Grass only	0	21
Grass + 5 cwt. Nitrate of Soda in Spring	0	25
Cultivation only	16	47

TABLE VII

Showing the Effects of Grass and Arable Conditions on the Chemical Composition of Apples

Variety	Grass or Arable	Nitrogen in Fresh Weight %	Acidity in Fresh Weight %	Reducing Sugars in Fresh Weight %	Sucrose in Fresh Weight %	Total Sugars in Fresh Weight %
Lord Grosvenor .	Grass	0·0253	0·607	7·16	0·63	7·79
	Arable	0·0484	0·604	7·17	0·70	7·87
Allington Pippin .	Grass	0·0356	0·639	7·57	2·91	10·48
	Arable	0·0456	0·841	7·27	3·39	10·64
Newton Wonder .	Grass	0·0191	0·467	7·99	1·52	9·51
	Arable	0·0429	0·537	7·52	1·31	8·83
Lord Grosvenor .	Grass	0·0270	0·710	6·54	2·05	8·59
	Arable	0·0426	0·663	6·02	1·33	7·35
Newton Wonder .	Grass	0·0209	0·413	8·18	2·85	11·03
	Arable	0·0462	0·525	7·22	2·50	9·72
Allington Pippin .	Grass	0·0177	0·845	6·93	3·18	10·11
	Arable	0·0694	0·827	6·61	3·04	9·65

TABLE VIII

Showing the Effects of Grass and Arable Conditions on the Development of Breakdown in Apples at 1° C.

Variety	Date examined	Breakdown %	
		Grass	Arable
Lord Grosvenor . . .	18/2/28	0	56
Allington Pippin . . .	4/4/28	0	69
Newton Wonder . . .	7/5/29	38	85
Lord Grosvenor . . .	20/2/29	0	43
Newton Wonder . . .	8/5/29	11	71
Allington Pippin . . .	20/2/29	6	25

Manuring—It may be taken as a general rule that high quality in Apples is associated with favourable levels of nutrition for healthy tree growth of the essential mineral nutrients and that fruit quality will suffer under conditions of serious deficiency or excess of any nutrient. At present twelve essential nutrient elements are known, viz. nitrogen, phosphorus, calcium, magnesium, potassium, sulphur, iron, manganese, boron, copper, zinc and molybdenum, and so far all excepting molybdenum have been shown to be important in the nutrition of Apple trees—molybdenum is the most recently established of the essential elements and its rôle in the nutrition of the Apple is as yet unknown, though it has been shown to be essential for the Myrobalan Plum.

Problems of quality in Apples in relation to nutrition usually concern deficiencies of the various elements and in Britain effects of excesses have generally been confined to nitrogen and potassium.

The effects on quality of an acute deficiency of any of the essential elements are always bad and must be avoided, though a slight deficiency of nitrogen often improves quality but may decrease yield.

Important deficiency effects of the respective elements are as follows:

Nitrogen: Colour is high, shape may be improved, firmness is increased, texture is crisp; acidity may be increased but this is offset by increased sugar content. Acute deficiency leads to lowered sugar content, poor flavour and a 'woody' effect to taste. Keeping properties are good.

Phosphorus: Colour effect is variable and fruits are generally of unattractive appearance, the ground colour being a dull green and the flush brownish-red; the fruits may also lack firmness; acidity is generally high in freshly picked fruits, but flavour may become "flat" and unpleasant. Quality is generally undesirable.

Potassium: Colour effect is variable and flush may be subdued or enhanced, but fruits often retain an immature appearance; acidity is low and total sugars may be high, but cane sugar is low; flavour is either sweet or lacking (woody). Storage properties may be satisfactory in ordinary temperature stores, though the fruits may shrivel excessively, but in low temperature stores fruits may suffer from low temperature flesh breakdown.

Magnesium: Colour is poor and fruits tend to retain immature appearance following severe defoliation of trees which results from the deficiency. Flavour is lacking (woody). (Fig. 47.)

Sulphur: Effects resemble those due to nitrogen deficiency.

Iron: Fruits are firm, ground colour is chlorotic and flush tends to be pronounced. Flavour is generally somewhat lacking due to low content of acid and sugars.

Manganese: Effects on quality often appear small unless the deficiency is acute when the fruits are of immature, woody type. (Few opportunities to study acute examples have occurred.)

Boron: Fruits are deformed and may show skin cracking and pitting, flesh pitting and browning of cortex or core area; they are generally useless. (Fig. 49.)

Copper: no data available.

Zinc: Fruits remain dwarfed and useless. (Fig. 50.)

Since excesses of nitrogen and potassium occur in practice the main effects of these are given below:

Nitrogen: Fruits are generally large and may be irregular in outline; colour is generally green and flush lacking or dull; flesh tends to be soft and to lack crispness; content of sugars is low and flavour tends to be acid. Storage properties are generally poor, due to susceptibility to rots and physiological breakdowns.

Potassium: When nitrogen is also high, fruits tend to be large and colour green; flesh is coarse in texture and dessert quality only moderate;

acidity and content of sugars both tend to be high. Storage quality is moderate, both as regards rots and physiological breakdowns.

Under low nitrogen conditions fruits are highly coloured, firm, crisp, with high sugar content and of high dessert quality. Storage properties are good. Excess potassium may also induce magnesium deficiency and result in typical magnesium-deficient fruits.

Control of pests and diseases. There are two points of importance in connection with the control of pests and diseases in relation to fruit quality. The first is that pests and diseases may cause unsightly blemishes or prevent the normal development of the fruits. Typical examples are apple scab and capsid bug. (Fig. 60.) The second point is that injuries caused by pests and diseases may provide starting points for the spread of rots during storage (e.g. scab) or they may hasten maturity (codling moth), in both cases shortening the storage period.

Pruning. Pruning systems on Apple trees vary between the extremes of light branch and shoot thinning and detailed spur pruning, important effects of the latter system being to curtail vegetative growths and to increase the exposure of the fruits to direct sunlight.

As regards the fruits, spur pruning increases size and colour, and these effects generally result in greatly improved appearance. Dessert properties are also improved and this is associated with an increase in the ratio cane sugar/reducing sugars. Storage life may be decreased and with the increased size there is a tendency for core flush to be replaced by flesh breakdown in the cortex. Differences between fruits from lightly pruned trees (branch or regulated system) and spur pruned trees are likely to be most evident in seasons of heavy crops when the numbers of fruits borne by the "regulated" trees are higher than those given spur-pruned treatment.

TABLE IX

Showing the Percentages of Reducing Sugars and of Sucrose for the Seasons 1928 and 1929, in Apples, variety Allington Pippin, receiving Differential Pruning Treatments.

Plots and Pruning Treatments	Season 1928 Light Crops		Season 1929 Heavy Crops	
	Reducing Sugars %	Sucrose %	Reducing Sugars %	Sucrose %
Buffer Row (3 buds)—Spur pruned	7·54	4·10	7·91	3·87
" " (5 ")— " "	7·30	4·09	7·84	3·76
B. Branch thinning	7·10	3·39	8·25	2·43
H. " "	7·58	3·59	8·55	2·80
D. " "	7·49	3·98	8·87	2·66
J. " "	7·25	4·03	8·27	2·99
F. " "	7·05	4·25	8·32	2·77
L. " "	7·54	3·50	8·54	2·77
Q.* " "	7·25	3·39	8·23	—
Q. (Scorched Tree) Branch thinning	—	—	7·79	1·63

* Plot Q. no manure; others complete fertilizer (N.P.K.).

TABLE X

Showing the Relative Percentages of Core Flush and Internal Breakdown respectively of the Total Breakdown in Cold Store for Seasons 1928 and 1929 in Apples, variety Allington Pippin, receiving Differential Pruning Treatments.

Plots and Pruning Treatments	Season 1928 Light Crops		Season 1929 Heavy Crops	
	Relative percentages		Relative percentages	
	Core Flush %	Internal Breakdown %	Core Flush %	Internal Breakdown %
Buffer Row (3 buds)—Spur pruned	38	62	5	95
" " (5 ")— " "	20	80	4	96
B. Branch thinning	54	46	75	25
H. " "	26	74	78	22
D. " "	47	53	87	13
J. " "	35	65	90	10
F. " "	53	47	83	17
L. " "	16	84	94	6
Q.* " "	29	71	50	50
Q. (Scorched Tree) Branch thinning	—	—	48	52

* Plot Q. no manure; others complete fertilizer (N.P.K.).

Fruit Thinning. The operation of fruit thinning results in a decrease in the number of fruits carried and when a heavy thinning is given the fruits on thinned trees are usually substantially larger than on comparable untreated trees. Comparisons under such conditions show that the effects of thinning are generally similar to those of hard spur pruning, although excessive thinning may produce more severe effects on storage life. As for spur pruning, the effect on the cane sugar/reducing sugars ratio is a prominent feature. (Table XI.)

TABLE XI

Showing the Effect of Thinning on the Sugar Content of Apples

Variety	Thinned or Unthinned	Reducing Sugars in Fresh Weight %	Sucrose in Fresh Weight %
Lane's Prince Albert	T.	6·94	2·80
	U.	7·24	2·39
Worcester Pearmain	T.	10·58	3·26
	U.	10·75	2·52
	T.	8·08	2·28
	U.	8·33	1·89
Bramley's Seedling	T.	6·93	2·36
	U.	7·39	2·17
	T.	8·95	2·61
	U.	9·40	1·92

TABLE XII

Showing the Effect of Fruit Thinning on the Storage Qualities of Bramley's Seedling—Season 1931

Treatment	Crop Weights per Tree	Breakdown in Cold Store, 216 days	
		Flesh Breakdown %	Core Flush %
Not thinned . .	337 lb. : 231 lb.	18	10
Thinned . .	189 lb. : 148 lb.	100	—

Bark-ringing and root pruning. The effects of these two operations on fruit quality are similar, though in practice those due to bark-ringing are generally more pronounced.

Bark-ringing is a useful method of improving quality in over-vigorous, light-cropping trees bearing large fruits of poor quality. The main effects on quality are similar to those produced by grass or by a fairly low level of nitrogen nutrition. The ringing operation must, however, be properly carried out or undesirable effects, both on the fruits and the tree, may result.

It is important to note that fruits of high quality produced by ringing and grass treatments respectively, although similar in appearance and dessert properties, differ in storage behaviour, especially in low temperature stores. Another disadvantage of ringing is that it may render the fruits, whilst on the tree, susceptible to high temperature injury.

The main effects of ringing may be summarized as follows: size is generally decreased, though sometimes it is increased where excessively high nitrogen conditions have resulted in small fruits; the fruits are firm and highly coloured, and the flesh is crisp, sweet and juicy;

TABLE XIII

Showing Typical Effects of Bark Ringing on the Content of Nitrogen and Sugars in Apples

Variety	Treatment	Nitrogen in Fresh Weight %	Reducing Sugars in Fresh Weight %	Sucrose in Fresh Weight %	Total Sugars in Fresh Weight %
Bramley . .	Unringed	0·0328	5·35	3·21	8·56
	Ringed	0·0218	6·14	3·01	9·15
Bramley . .	Unringed	0·0481	6·72	1·88	8·60
	Ringed, 1928	0·0367	6·24	2·13	8·37
	Ringed, 1929	0·0194	6·51	2·96	9·47
Bramley . .	Unringed	0·0497	5·83	2·81	8·64
	Ringed	0·0314	5·73	3·12	8·85
Bramley . .	Unringed	0·0375	6·96	2·36	9·32
	Ringed	0·0246	7·97	2·53	10·50

nitrogen content of the fruits is decreased and total sugars increased. Susceptibility to rots is similar to low nitrogen fruits, but "ringed" fruits are prone to storage breakdowns at low temperatures, particularly to superficial scald and flesh breakdown in the cortex.

Effects on composition and scald are illustrated in Tables XIII and XIV.

TABLE XIV

Showing the Effect of Bark Ringing on the Development of Scald in Cold Store

Variety	Treatment	Date of Examination	Scald %
Bramley's Seedling .	Unringed, fruit thinned	24/3/30	0
	" not "	"	0
	Ringed, fruit thinned	"	97
	" not "	"	63
Newton Wonder .	Unringed	28/3/30	15
	Ringed	"	31
Newton Wonder .	Unringed	7/5/30	0
	Ringed, 1928	"	0
	" 1929	"	44

Time of picking—early and late picking. Fruits acquire the properties associated with high quality, such as high colour, fairly large size and high sugar content, relatively late in the growth period, hence time of picking is important. Late picking, however, increases the rate of ripening in store and late picked fruits may suffer severely from storage rots and physiological breakdowns. The main features of early and late picked fruits are as follows:

Early pick: fruits are relatively small and poorly coloured, flesh is firm and contains considerable amounts of starch which is later replaced by sugars; flavour is lacking. During storage the fruits are liable to superficial scald.

Late pick: the size of the fruits is larger than those picked early and colour is also higher and the flesh softer; sugar content and acidity are relatively high and flavour well developed. The fruits ripen more quickly in store than the early-picked fruits and are more susceptible to both storage rots and flesh breakdown. In many instances where

TABLE XV

Bramley's Seedling—Early and Late Picks

Percentage Rots in Comparable Samples in Ordinary Temperature Store—1935 Crop

	Exposed Fruits			Shaded Fruits		
Early Pick . . .	13	31	19	24	43	27
Late Pick . . .	31	49	49	34	69	55

breakdown in early picked fruits takes the form of core flush, in the later picked fruits breakdown occurs in the cortex.

At Long Ashton we have been unable to confirm observations by other workers that early picking favours the development of bitter pit.

c. Miscellaneous Factors

Position of fruits on the tree—exposed and shaded fruits. Fruits exposed to direct sunlight are superior in appearance to those shaded by the foliage. They develop the most intense colour, are particularly firm and have the highest content of sugars.

Severely shaded fruits, on the other hand, may remain entirely green or the green may fail to develop and the skin remain partly chlorotic. Shaded fruits are often acid to taste due to their relatively low sugar content.

Exposed fruits may, however, have their appearance spoilt by high temperature injury of the water core type or the skin may suffer from russeting and cracking on the exposed sides of the fruits in sunny seasons. (Fig. 58.) In store, exposed fruits are more liable to develop bitter pit than shaded fruits, but the latter are more susceptible to rots and flesh breakdown.

TABLE XVI

Bramley's Seedling—Exposed and Shaded Fruits

Bitter Pit in Comparable Samples in Ordinary Temperature and Cold Stores—1935 Crop

						Totals.
Ordinary Temperature						
Exposed . .	41	36	9	61	37	184
Shaded . .	32	14	2	46	50	144
Cold Store						
Exposed . .	55	42	26	68	70	261
Shaded . .	37	16	12	42	34	141

TABLE XVII

Bramley's Seedling—Exposed and Shaded Fruits

Percentage Rots in Comparable Samples in Ordinary Temperature Store—1935 Crop

						Totals.
Exposed . . .	13	31	10	19	18	91
Shaded . . .	24	43	10	27	23	127

Position of fruits on the truss—terminal (King) and lateral fruits. Lateral fruits, which are formed from the lateral flowers of the truss, differ in quality from those formed from the terminal flower and are superior in quality. Terminals tend to be relatively long in shape and the skin is generally smoother and the stalks shorter than for laterals. Flavour is also less full than laterals, and cane sugar and dry matter contents are lower. The terminals are also more liable to lenticel spot

breakdown and to rots following from this trouble, and they often develop severe rotting during storage. They may, however, remain firmer than laterals and show less shrivelling in store. (Fig. 57.)

Light and heavy crops. Differences between fruits from light and heavy crops are generally similar to those described for spur pruned and lightly pruned trees, and for thinned and not thinned crops. Thus fruits from light crops are usually large, with high sugar content, especially high cane sugar, and are frequently poor keepers, being susceptible to bitter pit and flesh breakdown. These poor keeping qualities render it inadvisable to store fruits from light cropping trees for any considerable length of time.

Size grading. When fruits from any crop are graded for size, the grading operation automatically grades other characters of the fruits, such as colour, flavour, content of certain chemical constituents, particularly cane sugar, ash and potash content, and also storage properties. Table XVIII illustrates a typical effect of size grading on chemical constituents.

TABLE XVIII

Showing the Relationship between Size Grades and Chemical Constituents of Apples—Variety Allington Pippin

Size Grade. (large to small)	Reducing Sugars in Fresh Weight %	Sucrose in Fresh Weight %	Total Sugars in Fresh Weight %	Ash in Fresh Weight %	Potash in Fresh Weight as K_2O %	Potash in Ash as K_2O %
1	10·19	3·09	13·28	0·19	0·098	51·0
2	10·41	2·68	13·09	0·16	0·084	50·5
3	10·60	2·58	13·18	0·16	0·081	49·6
4	10·39	1·70	12·09	—	—	—
5 and 6	10·02	0·89	10·91	0·12	0·048	45·4

CONCLUSION

In concluding this lecture, I should like to emphasize some of the points discussed which are of special importance in attempting to produce Apples of high quality.

In the first place it is necessary to recognize the various points which constitute good quality—size, shape, colour, texture, flavour and storage properties. In any particular garden or orchard one or more of these factors may be unsatisfactory for the special end in view and usually substantial improvements can be effected by attention to the points I have discussed to-day.

It is important to start right, to plant suitable varieties on rootstocks whose characteristics are known, and to see that the trees are healthy and clean. The limitations of the site and the special features of the climate, particularly of rainfall and sunshine, must be recognized.

Extremes of soil conditions, the very heavy and the very light, the poorly drained and droughty, the highly calcareous and the strongly

acid, should be avoided where possible as these conditions raise difficult problems in tree nutrition and are often associated with poor or variable quality. High levels of cultivation and manuring will often produce high yields, but quality may be only moderate or low under these conditions, shape, colour, flavour and keeping properties being all adversely affected. Over-liming should be avoided. Grass culture combined with frequent cutting of the herbage, which should be left to rot *in situ*, usually affords the best conditions of nutrition for high quality production. A fairly low nitrogen level will often ensure high dessert quality and good keeping properties, and it is important to learn how to adjust the nitrogen supply by cultural practices and manuring.

An efficient control of pests and diseases is essential for high quality production. Manual operations on the tree, such as pruning, fruit thinning and bark ringing can be used to regulate size, colour and flavour, but they also affect storage properties and these effects must also be appreciated.

Exposure and shade, the position of fruits on the truss and the time of harvesting also produce significant effects on quality, and management practices must take due regard of these points.

NEW AND NOTEWORTHY PLANTS

Calceolaria Darwinii

A NUMBER of years ago I wrote an article for a gardening publication on the cultivation of "difficult" rock-plants and complained how difficult it was to keep *Calceolaria Darwinii* in good health in the garden. Some months later a British farmer in Patagonia wrote to me saying that *Calceolaria Darwinii* grew wild on his farm. He wrote that it grew on gravelly soil but always in places where it was shaded from the morning sun. This tip was too good to miss, so we moved our plants, or what remained of them, into a position on the "Billiard Table," where they were well shaded from the morning sun. This is a raised bed about 3 feet high, constructed of old railway sleepers. It has good drainage of broken bricks at the bottom and is then filled with a mixture of soil, sand and peat. We call it the "Billiard Table" because it looked like one before it was planted. It is most useful for growing small plants that need careful cultivation. *Calceolaria Darwinii* has grown in this position for many years, ever since some plants were given me in 1930 by that great gardener, my friend the late MR. CHARLES MUSGRAVE, but never have they flowered as they did this year. This hot summer, however, has been a sad trial for them, or their over-indulgence in flowering has perhaps overcome them, as they are looking somewhat dishevelled and sorry for themselves at this moment. (Fig. 39.)

F. C. STERN

ROSES AS FLOWERING SHRUBS

J. Wilson

GENERALLY speaking Roses are usually planted too sparsely, with the result that too much soil is visible at all seasons.

In the average garden hard pruning of Roses is more often a failure than a success; many fail to recognize that the Rose is naturally a shrub and not an herbaceous plant to be cut down more or less to ground level annually.

Enthusiasts are loud in their praises for the merits of hardy shrubs, including Rose species, but few recognize the virtues of some strong growing Hybrid Tea and Hybrid Perpetual Roses when they are allowed to develop into shrubs.

Few hardy shrubs have as long a flowering period as these Roses which bloom profusely in June and September and more or less continually between these periods. Grown as shrubs they must be properly sited; the bushes should be massed in comparatively large beds or borders, or in a suitable formal setting as shown in the photograph. (Fig. 61.) They are entirely out of place in small formal beds.

When in flower the effect is a glorious display of colour and, although the individual blooms may not possess the form of the modern varieties, the general effect compares favourably with the performance of most shrubs.

Once established these Roses require the minimum of labour, and are capable of carrying on over a period of many years.

Unless one is familiar with the behaviour of such Roses it will be assumed that the bushes are liable to become leggy and unsightly, but such is not the case, as young growths are frequently produced from the base of the old, affording from time to time an opportunity to renew the bushes.

Not all varieties of Hybrid Teas will develop into shrubs, but owing to their natural mode of growth there are a number which usually flourish wherever soil conditions are favourable or where Roses grow reasonably well.

Plant at not more than 2 feet apart in each direction and prune rather severely the season after planting. The following and subsequent seasons strong growths should be lightly pruned with the object of gradually building up a good framework. Remove the weakest growths and prune hard those of moderate vigour for the purpose of encouraging strong shoots to flower the following season. Sizeable bushes are produced in about three years and when fully developed these should be about 4 to 4½ feet high after each annual pruning. During the flowering season the bushes should present a solid mass of growth 5 to 6 feet high as shown in the photograph of the variety 'Dainty Bess." (Fig. 62.)

Varieties which have been found suitable for growing in this form include some strong growing Hybrid Teas and Hybrid Perpetuals such as:—

Tea and Hybrid Tea Roses

Betty Uprichard (Salmon carmine)
Caroline Testout (Bright rose)
Dainty Bess (Salmon pink, single)
General McArthur (Red)

Lady Hillingdon (Orange yellow)
Ophelia (Salmon flesh shaded rose)
Red Letter Day (Crimson, semi-double)

Hybrid Perpetuals.

Capt. Hayward (Bright crimson)
Frau Karl Druschki (White)
Hugh Dickson (Red)
Mrs. John Laing (Soft pink)
Ulrich Brunner (Bright cerise red)

Other varieties worthy of a trial include:—

Edouard Renard (Deep pink, orange shading)
Etoile de Hollande (Dark red)
Hector Deane (Salmon orange)
Lady Sylvia (Flesh pink)
Lucie Marie (Apricot yellow)
President Hoover (Orange red)

NOTES FROM FELLOWS

A yellow flowered form of Pæonia Potaninii

SOME twenty years ago I was given, most appropriately by COLONEL F. C. STERN who already then was greatly interested in the genus, some seeds of *P. Potaninii*. These germinated well and I soon had a large clump covering many square yards and growing 3 to 4 feet high.

In the summer of 1946, I noticed a yellow flower near the outside of the clump—the normal colour of the flowers of my plant is dark maroon. I picked and pressed this and later found several more yellow flowers near the plant from which I had picked the first. At the same time I noticed that the leaves of the plants bearing the yellow flowers were differently coloured too. In the normal plants the petioles, petiolules and the midrib of the segments and the lobes (parts which might unscientifically be described as the veins of the leaves) are coloured red, while in the case of the plants bearing yellow flowers they are coloured pale primrose yellow.

P. Potaninii is easy to propagate; it spreads freely by underground stolons, and its seed germinates well. It is, of course, impossible to say why some of my plants have apparently lost some pigment which causes the change of colour in the flower and in the leaves. The first pressed yellow flower was sent by me to the Royal Botanic Gardens, Kew, who stated that this was not the var. *trollioides* of *P. Potaninii* but a yellow flowered variant of that species and that they had failed to trace a previous record of such a variant.

The flowers of this species hang down amid the foliage and are almost invisible unless the leaves are lifted; in the case of my yellow-flowered form the flowers are brighter and therefore more prominent. To this extent it is an improvement on the normal form and an interesting plant. I have not yet had time to ascertain whether seed from the yellow form comes true to colour, but I am making some trials to find out.

MAJOR ALBERT PAM, O.B.E., M.A., F.L.S., V.M.H.

Plant Growth under Controlled Conditions

The primary aim of the horticulturist is to provide for his plants those conditions of soil and environment which will enable them to grow in a way which will give him the maximum return either in crop or æsthetic enjoyment. It is put this way because it is worth remembering that it is not necessarily the maximum amount of growth that is required of any plant. Thus, a fruit tree or a tomato plant which makes immense growth may produce less of the desirable part of the plant, the fruit, than one of much more moderate growth. Conversely, a lettuce or a carrot plant which flowers freely is of no value to its cultivator, unless he is growing a seed crop.

A plant which is growing "naturally," that is, in its normal wild habitat, will tend to assume that type of growth which will best ensure its survival in competition with all its neighbours, and this growth will usually focus on the reproductive phase. The horticulturist is always "interfering with Nature" in attempting to control the growth and development of the plant to his special needs. If we were never to "interfere with Nature," as some confused minds would assert, we should not even hoe our fields for the removal of weeds, let alone grow plants in frames and glasshouses.

The investigation of the factors of the plant's environment which determine its "behaviour" is the special field of the experimental plant physiologist. To analyse the effects of the wide range of interrelated factors which make up the environment he must have each one under his control so that he may determine how variations in its value react upon the plant. Up to now, no one experimental station has been able to construct equipment in which all the factors of light, temperature, humidity, gas content of the air, wind, rain and fog could be simultaneously and independently controlled and varied. Investigators have had to be content to experiment on one or two of these, maintaining the others either at some arbitrarily fixed value or, more often, leaving them uncontrolled.

Now, through the munificence of Mr. Harry Earheart, president of the Earhart Foundation of Ann Arbor, Michigan, it has been possible to construct at the California Institute of Technology in America, a laboratory in which each and every one of the factors mentioned is independently controllable over a wide rage. In this laboratory, which has been, perhaps not very aptly, nicknamed the "phytotron" in analogy with the cyclotron of experimental physics, it is hoped to provide for physiologists, first, plant material for research of a uniformity never previously achieved on such a scale and, second, a means of analysing and assessing the importance of most climatic factors on plant growth and development.

The most elaborate means of ensuring constancy of control, freedom from all risk of disease and for the recording of results have been provided and a perusal of the description* leaves little wonder that the cost of building and equipping this unique laboratory was close on half a million dollars.

* "The Earhart Plant Research Laboratory," by F. W. WENT, *Chronica Botanica*, Vol. 12.

Botanists, horticulturists and agriculturists will await with the keenest interest the far-reaching results which should come from the new institution. In the meantime, workers in the field of environmental physiology in this country and elsewhere will not be discouraged by reason of their more modest facilities from continuing their studies of special aspects. R. H. STOUGHTON

Can we increase the vigour of Difficult Species?

It is widely recognized in horticulture that the F_1 progeny of a cross between two related species often exhibit hybrid-vigour (heterosis). The genetic principles that lie behind this phenomenon lead one to expect that gardeners could raise crosses *within* a species that may be more vigorous than their parents.

Rarity has been interpreted by J. L. STEBBINS, JR. (in *Madroño*, Vol. 8, p. 248, 1942) as being due to genetic homogeneity, rare species consisting of relatively few biotypes that are themselves more or less homozygous. If this hypothesis is correct—and it has been widely accepted—then it follows that if two geographically isolated races of a rare species are crossed, the biotype-supply will be replenished and a more vigorous heterozygous race will result. In our gardens we try to grow a great many plants, rare in nature, that are persistently difficult. If individuals of these could be crossed with individuals of the same species introduced from a different natural locality, it seems possible that we may be able to raise progeny of greater "aggressiveness" than the races we already cultivate. P. H. DAVIS

Forms or Hybrids

At the present time there is a growing tendency to attribute all changes that occur in Alpine plants to hybridization. Hybrids* do occur, there is no doubt about that, but to make the sweeping assertion that every observed change seen in our plants is due to the crossing of one species with another has very little evidence to support it. In this short note I should like to deal only with one plant, *Gentiana Farreri*, which has been growing in my garden for some seventeen years and I may say has been under close observation and the subject of some little experiments which have been described elsewhere.

G. Farreri was found by FARRER on Thundercrown in Tibet in 1914. Seeds were sent to the Royal Botanic Garden at Edinburgh. The first flowers appeared two years later and it is from this stock that all the *G. Farreri* of the present day have been derived. FARRER described the colour as a "fierce luminous Cambridge blue." The plant created quite a sensation when first exhibited. The shape and colour, particularly the colour of the flowers, were unique. Unfortunately that was long before the publication of the Horticultural Colour Chart. The general belief among Gentian growers appears to be that the colour was near to the Kingfisher Blue of the Chart. The blue had a tint of green in it. The only concrete evidence I have of the colour, is a water-colour drawing done in 1935, in which the lobes of the flower match with Kingfisher

* The word 'hybrid' is used in this note to refer to an inter-specific cross.

Colour Photograph, Fine Art Engravers

FIG. 39—*Calceolaria Darwinii* at Highdown, Goring-by-Sea, Sussex, 1949
(See p. 106)

Colour Photograph, N. K. Gould

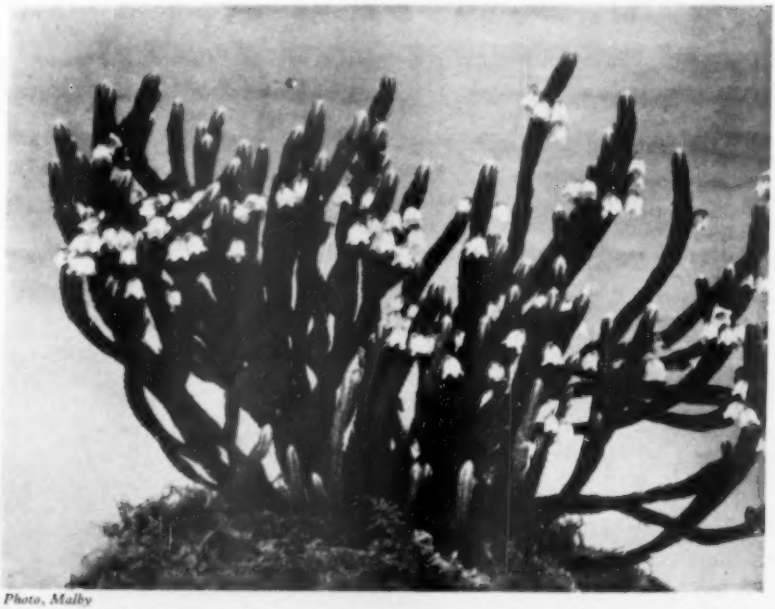
FIG. 40—*Meconopsis betonicifolia* and *Primula chungensis* in the Wild Garden at Wisley, June 1949

Photo, Downward

FIG. 41—*Primula Dickieana*. Plant grown by MR. AND MRS. J. RENTON of Perth from seed sent from S.E. Tibet (See p. 87)

FIG. 42—Forms of *Primula Dickieana* from the Doshong La (See p. 88)

FIG. 43—*Cassiope selaginoides* covering a hillside in S.E. Tibet
(See p. 89)



Photo, Malby

FIG. 44—*Cassiope Wardii*. A plant grown by MR. R. B. COOKE of Kilbryde, Corbridge-on-Tyne, Newcastle, which received an **A.M.** on May 3, 1949. It was raised from seed collected in S.E. Tibet (See p. 89)

FIG. 45—*Paeonia Mairei* from the lower Tsangpo valley (See p. 90)

FIG. 46—*Diplarche multiflora* on the Lusha La (See p. 89)

FIG. 47—Well-grown Apple tree, variety Sweet Alford, age 14 years. It has recently become magnesium deficient, causing premature defoliation. As a result the fruits fail to ripen and are small and woody (See p. 99)

Photo, Long Ashton Research Station

FIG. 48—*Diapensia Wardii* on the Doshong La (See p. 88)

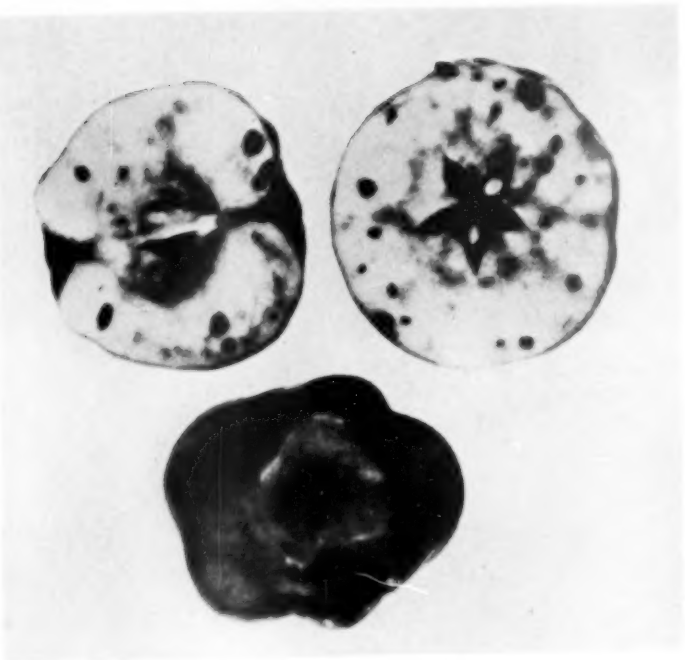


FIG. 49—Boron deficiency. Variety Fameuse. Fruits are deformed and show corky areas in flesh and browning of the core area.

(After A. B. BURRELL, Cornell University Extension Bulletin 428 (1940)
(See p. 99)

Photo, Long Ashton Research Station

FIG. 50—Zinc deficiency. This results in severe dwarfing of fruits. Plate shows young Apple fruits from zinc deficient tree (left) and comparable fruit from healthy tree (right) (See p. 99)

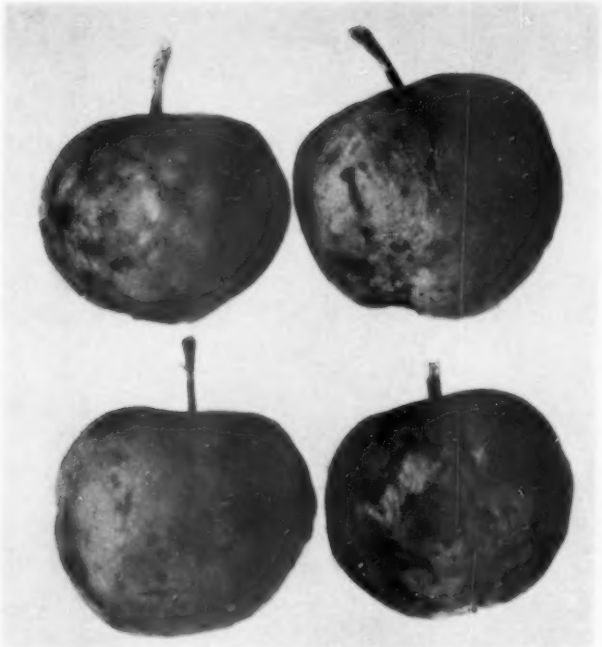


FIG. 51—False Sting, a virus disease of Apples, variety Sweet Alford. Note lesions in skin. Fruits fail to develop in a normal way (See p. 94)

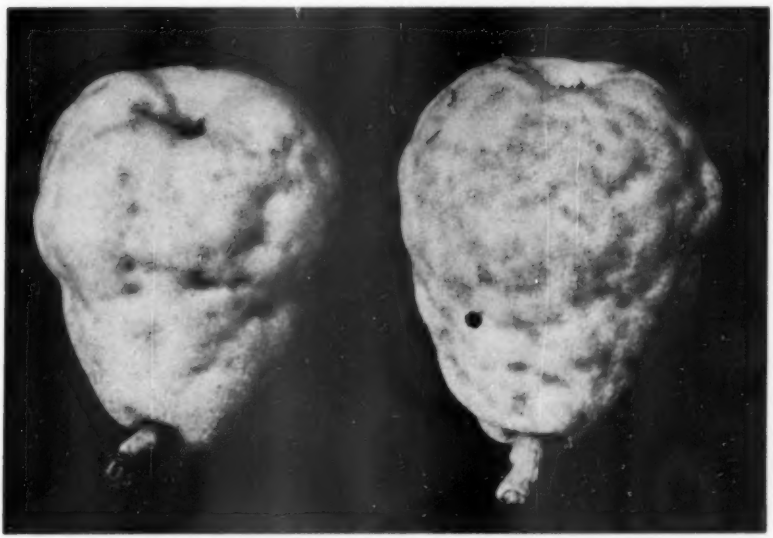


FIG. 52—Stony Pit, a virus disease of Pears, variety Doyenne du Comice. The surface is irregular in shape and is severely pitted. The flesh shows corky areas similar in appearance to Bitter Pit and Cork in Apples (See Figs. 49 and 59) (See p. 94)

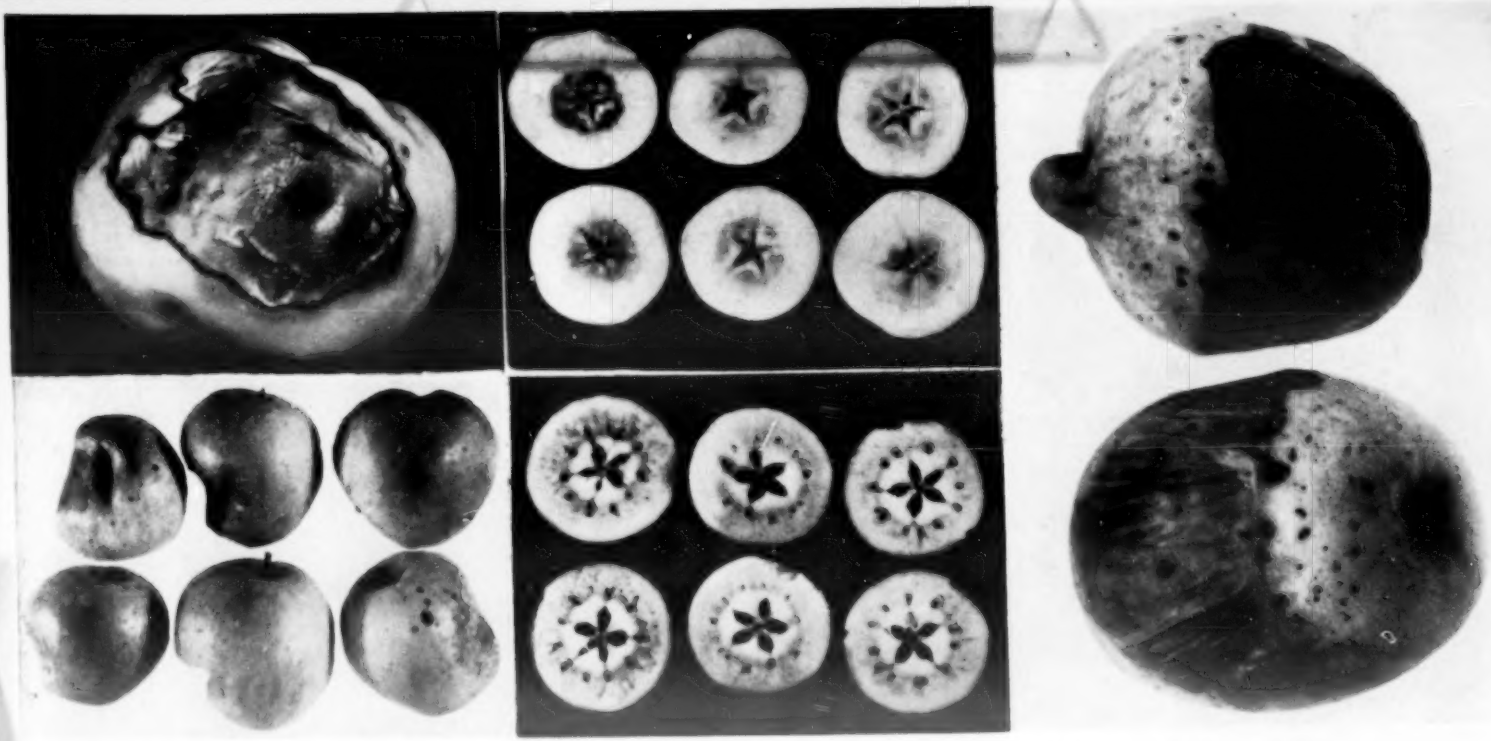


FIG. 53 (top left)—One form of high temperature injury, variety Bramley's Seedling. Note the sharp demarcation of the injured area. (See p. 95)
FIG. 54 (bottom left)—High temperature injury of Allington Pippin. Note the depressed areas near the calyx end of the fruits. The injury occurs during heat waves (See p. 95)
FIG. 55 (top centre)—Core Flush, variety Bismarck. Some varieties, notably Bismarck and Newton Wonder, tend to develop this type of breakdown in store rather than Flesh Breakdown. It is also a common form in smaller and poorer grades of fruits. (See pp. 92 and 101, Table X)
FIG. 56 (bottom centre)—Low Temperature Flesh Breakdown, variety Cox's Orange Pippin. This type of breakdown usually develops in the larger grades of fruits. (See pp. 92 and 101, Table X)
FIG. 57 (extreme right)—King Fruits, variety Allington Pippin. Note long narrow shape, excrescence at stalk end and lenticel spotting followed by extensive rotting. (See p. 104)

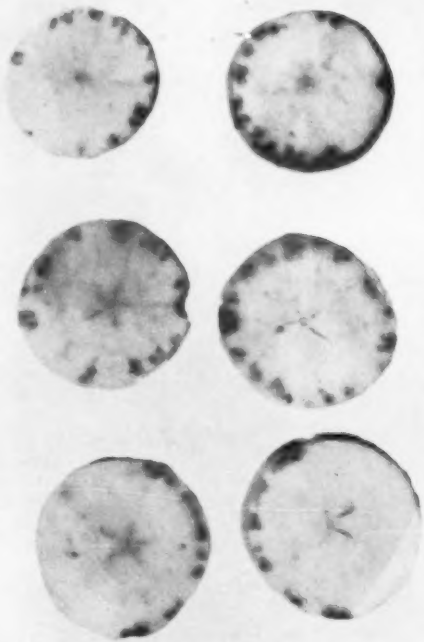
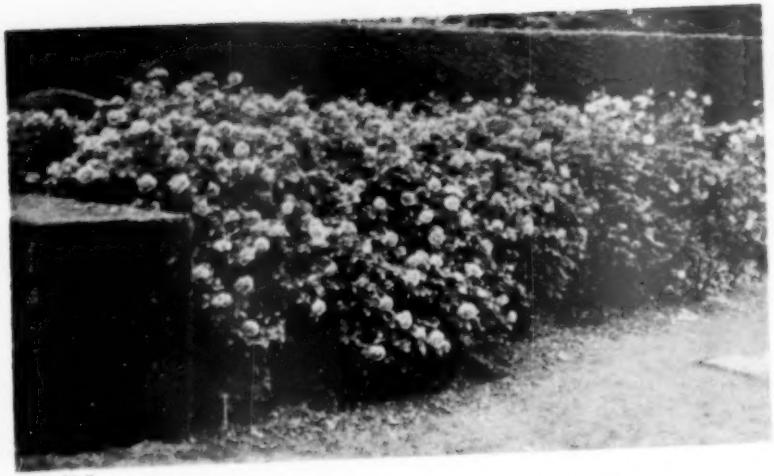


FIG. 58 (left)—Skin cracking of the variety Edward VII. This occurs on this variety in fruits exposed to bright sunlight and is similar to the Drought Spot symptoms caused on some varieties by boron deficiency. The condition in Edward VII has not been improved by boron treatment (See p. 104)

FIG. 59 (centre)—Bitter Pit in Newton Wonder. In this variety the pits are often restricted to tissues immediately below the skin (See p. 92)

FIG. 60 (right)—Capsid markings on Apples. The fruits are dwarfed, deformed and show russeted areas on the skin (See p. 100)



Photo, Malby

FIG. 61—Rose 'Hugh Dickson' at Trent Park (See p. 107)

Photo, Malby

ROSES AS FLOWERING SHRUBS

FIG. 62—Rose 'Dainty Bess' (See p. 107)

FIG. 63—Tulip bulb attacked by Grey Bulb Rot and showing the resting bodies (*sclerotia*) of the fungus (See p. 115)

Photos, Plant Pathology Laboratory, Harpenden

GREY BULB ROT OF TULIP

FIG. 64—Tulip shoots killed by Grey Bulb Rot (See p. 115)

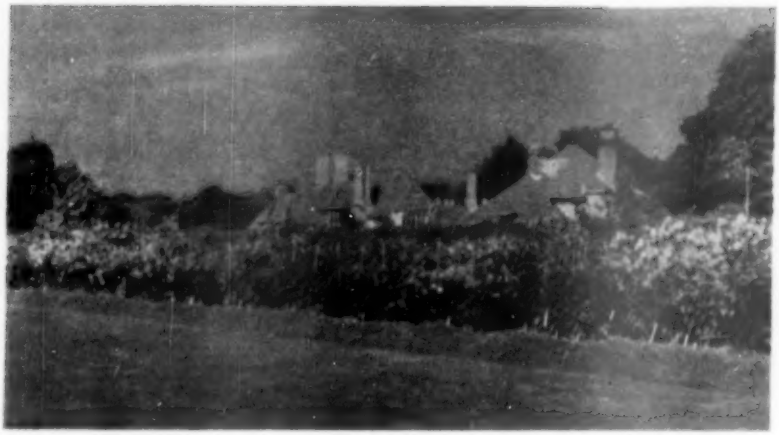


FIG. 65—Dahlia Trials at Wisley, October 10, 1949 (See p. 130)

Colour Photographs, N. K. Gould

FIG. 66—Antirrhinum Trials at Wisley, July 20, 1949 (See p. 117)

Blue 50/2. The drawing has been kept covered and is unlikely to have faded appreciably. Is our recollection of the original green tint exaggerated with the years?

Diligent enquiries have failed to find anyone who claims to have *G. Farreri* with flowers of the original colour. I am told that *G. Farreri* readily hybridizes with other gentian species growing near it and that all the plants now growing under that name are "not true," by which, I take it, is meant the plants are hybrids. To quote from one letter received in answer to a request for sample flowers, from one of our Botanic Gardens. "Our own stock is not true, so there is no use in sending our flowers." While bowing to eminent authorities in the Horticultural World, I do not believe that all our deeper coloured *G. Farreri* are hybrids and for the following reasons:—

(1) If all are hybrids, it means the original species has died out. *G. Farreri* is an easy plant to propagate vegetatively by division in March or by rooting cuttings. Nurserymen usually prefer to root cuttings if possible rather than raise plants from seed.

(2) *G. Farreri* could only hybridize with another gentian species if both are in flower at the same time. The season for *G. Farreri* is in late August or early September. *G. septemfida*, *G. lagodechiana*, *G. Loderi* and *G. cachemirica* are all earlier than *G. Farreri*. In my garden the first two are over and have set seeds before *G. Farreri* comes into flower. The other two although earlier still have open flowers. *G. sino-ornata* and *G. Veitchiorum* are much later and many of the flowers of *G. Farreri* will have set seed before they open. The pollen of *G. sino-ornata* is probably the most likely to find its way to the flowers of *G. Farreri* because it is grown in such large quantities, being the easiest of all the Autumn gentians to propagate and grow. *G. Macaulayi* was the result of a deliberate crossing of *G. Farreri* and *G. sino-ornata*. He would be a very casual observer who could possibly mistake *G. Macaulayi* for *G. Farreri*. Not only is the colour different but the leaves are wider and shorter. Strong tufts of leaves appear from the nodes of the flower stem, giving the plant quite a bushy appearance in contrast to the slender grass-like leaf growth of *G. Farreri*.

(3) If the present *G. Farreri* is a hybrid then according to Mendel's Law, the original characters of the parents (in this case the colour) should reappear in succeeding generations. Several generations have been raised in my garden during the past seventeen years, but there is no sign of a reappearance of the green tint.

(4) Change in the colour of the flower of certain plants is well known, for instance the Hydrangea, but that change in colour is due to chemical action on the soil solutions in one growing season, whereas the change in the colour of *G. Farreri* has been gradual and seems to be the cumulative effect of many differences the plants find in our gardens, which vary in many respects from those on Thundercrown.

Surely the evidence is against the hybrid theory and in favour of the plants we now have being still a true species.

G. H. BERRY

The Highlands, Ridgeway,
Enfield, Middlesex.

The Life of a 'Variety'

I was particularly interested in the article by MR. JAMES KELWAY in the July issue of your JOURNAL on the Life of a 'Variety.' I discussed this matter many years ago with MR. PITTMAN, B.A., B.SC., at the time West Australian Government Plant Pathologist and formerly of the Waite Institute, and while not pretending to have scientific knowledge myself on this subject, am but trying to record MR. PITTMAN's opinion, expressed when I said that a variety deteriorated.

MR. PITTMAN claimed that deterioration of any variety was due to disease or to the failure to cull out inferior "sports." He referrred to a farm on which a strain of our "Delaware" potato had been grown for twenty years without its having shown deterioration. "Rogueing" had been rigorously carried out. On other farms in the locality the variety had deteriorated because of virus diseases until yields were only between 2 and 3 tons per acre.

With respect to Gladioli I cannot go back as far as MR. KELWAY to the Gladioli of the 1870's to the 1890's. I did grow such as were great Gladioli at the beginning of the century, 'America,' 'Prince of Wales' and others whose names I forget. These, as so many other varieties of flowers, passed into oblivion, because newer varieties were so much better.

In this connection MR. PITTMAN pointed out that most flowers sported, some much more than others, but the ordinary grower, whether amateur or professional, took little or no notice of a "sport" except one in colour, whereas there was every reason to believe that "sporting" was going on all the time, in other characteristics, such as, better or worse stem, more or less buds on a spike; only generally it was for the worse. When reproduction was carried out from all the plants of a variety, the deterioration, due to sporting must, in the course of a number of years, cause the variety to be passed out. This is what has happened apparently in the U.S.A. with the famous variety 'Picardy', which it is claimed is being cast out by many cut flower growers because it is becoming more and more club headed. On the other hand amateurs are continually showing spikes of the variety, which they had reproduced only from their best plants, as fine as ever it was.

Some amateurs in Western Australia, who exhibit spikes at the show almost certainly as fine as anything in the world, put down part of their success to reproducing only from the best spike.

A good many years ago I was asked by a Nurseryman in Western Australia, who grows possibly 250,000 Gladioli for his shop, to go round his plots and see if I could give my advice. I pointed out some plants obviously infected with virus and a number of others that did not look as healthy as they should do. I said "You have not time, unless you get an epidemic of disease, to keep taking odd plants to the Pathologist. Anything you think does not look healthy, root it up at once and burn it, then you will have a number that are short headed (I pointed out some). Though healthy looking, leave them until you cut the spike and then pull the plant up. They can be collected afterwards and then destroyed." This advice was but putting into practice what MR. PITTMAN had advised.

Comparatively lately the member of the firm who runs the nursery said to me "I have faithfully followed your advice and it is remarkable to-day how few plants are culled out." Scientifically I realize that this episode was not an experiment, nor did it prove anything, but I do claim that it makes one think.

If you could turn up the records of the Daffodil Conference, which took place some years before the war, I think you will find some gentleman told how he had bred up from one bulb a better 'Sir Watkin' and a day or two later, on a visit paid to his nursery, he showed what he had spoken of, i.e. the benefit of selection. Either his one bulb selected had sported a better flower or it had remained the same and the others sported worse.

The whole subject is a very interesting one and so far as my particular flower is concerned, the Gladiolus, I have not read of any work being done on the subject anywhere, even in U.S.A., where so many research stations, including most of the many Universities, are doing some work of investigation on this flower.

CLAUDE L. PIESSE
Bassendean,
Western Australia.

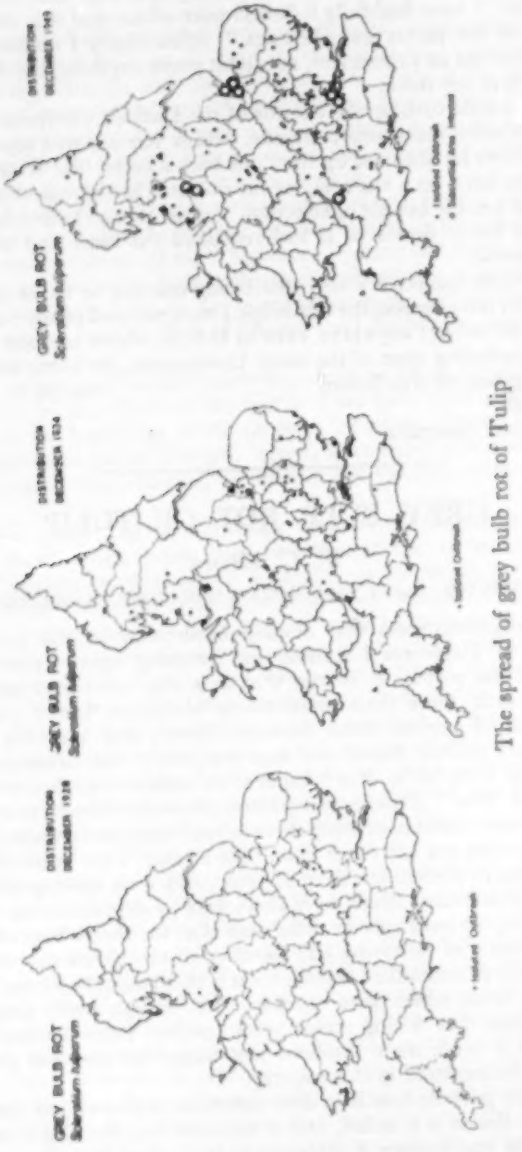
GREY BULB ROT OF TULIP

W. C. Moore

(DIRECTOR, PLANT PATHOLOGY LABORATORY, HARPENDEN)

THE disfiguring spots that develop most years on the leaves and petals of Tulips are a familiar and irritating sight to most people who grow the plant. It is true that in a dry and sunny spring the spots do little more than cause minor blemishes, but if prolonged wet or humid periods occur between March and May the disease spreads very quickly indeed and may completely ruin ornamental and commercial Tulip beds. It is because of its rapid spread that the disease was named "Fire." Experienced growers are aware that severe attacks of Fire occur only about once every three or four years, and are always worst where the bulbs are left down more than a year. They know, too, that late planting in November, deep planting, and wide spacing all help to check its appearance. Many have also learnt by experience the wisdom of inspecting the beds once or twice soon after the shoots have emerged, with the object of removing and burning all the plants that come up with mouldy or malformed shoots, for it is these mouldy shoots that act as centres from which Fire spreads. But though many know Fire few are aware that during recent years another Tulip disease, and in some ways a much more insidious and dangerous one, has gradually been establishing itself in this country.

My main purpose here is to draw attention to this second disease, or Grey Bulb Rot as it is called, and to the need for checking it before it becomes the real menace it threatens to be. Grey Bulb Rot has been known in Holland since 1884, but was not recognized in this country until found at Kew in 1922. During the next few years it was seen here and there occasionally, but from about 1928 it began to turn up fairly



The spread of grey bulb rot of Tulip

regularly. The accompanying maps, which give the known distribution of the disease in England and Wales at the end of 1928, 1934 and 1949, illustrate better than words can express the rapid extension of the disease. The total numbers of recorded attacks have no great significance, for there are probably many which have never come to light, but it is evident that few English counties are now completely free from it, and in several districts—indicated on the map by rings—the disease is prevalent. It frequently occurs under glass in forced Tulips, and in the open is a source of much loss and disappointment in private gardens and commercial fields alike.

It should not be difficult to recognize Grey Bulb Rot in field or garden. The first thing to attract attention is the presence here and there among healthy and flourishing Tulips of bare patches where the plants have not come through. Sometimes a few diseased shoots or even an apparently healthy plant or two may be the only visible sign that bulbs were planted in these patches, and these usually collapse and die within a few weeks (Fig. 64.) The patches are often only a yard or so across to begin with, and it is not unusual, especially in private gardens, to blame slugs or soil insects and leave it at that. The following year, however, the patch is larger and in time, if Tulips continue to be planted, whole beds may remain bare. Experience in forcing boxes is much the same; failure to produce shoots leads to gaps in the boxes, while many of the shoots that do appear are crippled or consist merely of badly torn, ragged foliage. If bare patches are found in a Tulip bed Grey Bulb Rot can be suspected at once. Actual proof is not so easy and specialist advice may be necessary.

First of all try to find some of the bulbs that were planted in the bare patches and carefully dig them up. If the trouble is Grey Bulb Rot you will notice that the young shoot is soft and rotten or is missing altogether; that the soil tends to cling to the nose of the bulbs; and that the roots seem to be well developed and the lower half of the bulb is frequently quite normal. Take a few of the bulbs and by degrees knock or wash off the soil until the neck of the bulb is exposed. Then peel off the outermost brown scale and cut one or more of the bulbs lengthwise. You may find as you remove the soil that it is permeated with a whitish mycelium: and you will certainly discover on cutting the bulbs that the scales are discoloured grey or pinkish-grey from above downwards. The rot may or may not reach the bottom of the scales and the basal plate. You can be quite certain the disease is Grey Bulb Rot if you search for and find on the rotting shoot, among the soil at the nose of the bulb, or under the brown covering scale some white, brown, or almost black, flattened or rounded bodies ranging in size from that of a mustard seed to that of a Sweet Pea seed, for these are the resting bodies (sclerotia) of the fungus that causes the disease. (Fig. 63.) The name of the fungus is *Sclerotium tuliparum*. The resting bodies, which take some finding until one is familiar with them, are firm but not hard: and when cut across or pinched open with the finger nail the interior is seen to be white or more often pinkish-white.

Having satisfied oneself about the presence of Grey Bulb Rot, several questions naturally arise. How did it get there, how does it spread, how long does it remain in the soil, what plants can safely be

grown in contaminated land, and how can the disease be eradicated or controlled? Unfortunately complete answers cannot yet be given to all these questions.

The most difficult one to answer is the first. It is generally assumed that the fungus is introduced into fresh soil with the bulb, and this is the most feasible explanation, although affected bulbs are usually so severely damaged that they are useless for planting purposes. Possibly resting sclerotia are occasionally present on the outer scales of otherwise healthy Tulip bulbs, or the fungus may be introduced with one of several other less susceptible bulb hosts. Whatever the true explanation, once the fungus gets into the soil it can remain alive there for at least three or four years in the absence of Tulips or other susceptible plants. As far as is known it does not produce spores and therefore the disease, unlike most fungus diseases, does not spread above ground from plant or place to place. It remains in the soil, but can of course be moved short distances when digging or ploughing, or longer distances when the sclerotia are carried in soil adhering to boots, spades, forks, cart wheels and the like. That is why an old patch gets larger each year, and why new small patches usually begin not far away from the old ones. Bulbous Irises are as susceptible as Tulips, and Grey Bulb Rot has also been found occasionally on Hyacinth, Narcissus, Colchicum, Crocus and Ixia. *Gladiolus*, *Dicentra* (*Dielytra*) *spectabilis*, *Scilla sibirica*, and *Fritillaria imperialis* are also said to be slightly susceptible.

The indirect or passive method of dealing with Grey Bulb Rot can be deduced from the facts given above. It is obviously useless to try and grow Tulips or bulbous Irises immediately in soil where the disease has occurred. The other plants mentioned are more resistant and might not suffer much, but their presence would suffice to keep the fungus alive in the soil, perhaps for many years. None of these plants, therefore, should be grown in contaminated soil for at least four years, at the end of which the fungus may be expected to have died from starvation. Other plants could be grown without risk. This passive method would naturally not prevent the transfer of contaminated soil during digging or on tools to other parts of the garden or field, where susceptible plants may be growing.

It is therefore best to adopt active measures to try to eradicate the fungus from the soil. A simple method, where the patches are quite small and the work is done very thoroughly, is to remove the soil to a depth of about a foot, discard it altogether, and replace with fresh soil. For these and rather larger areas it is possible to disinfect the soil after removing and burning as many diseased bulbs as can be found. Where steam sterilization of outdoor beds is a practical proposition, steaming for an hour completely eliminates the fungus. Failing this, chemicals can be used, though they may not be 100 per cent. effective. Formaldehyde, for example, has given good results when diluted with water. Mix one part of commercial (38 per cent.) formaldehyde with 49 parts of water and apply sufficient of the solution to the loosely dug patches to penetrate and wet the soil to a depth of 6–8 inches. One gallon of the diluted solution per sq. ft. should be ample unless the soil is very dry. This is about twice the amount normally recommended for ordinary soil sterilization and is necessary because the sclerotia of the fungus

are fairly resistant. It is advisable to cover the treated soil for 48 hours with sacking or other similar material drenched with the formaldehyde. Later, the ground should be lightly forked over, and planting with Tulips or other plants can then be safely carried out some four or five weeks after the treatment.

Good results have also been obtained with a fungicidal powder containing penta-chloro-nitro-benzene as its active agent. This powder is available on the market. In the open it should be thoroughly incorporated with the surface soil two or three weeks before planting the bulbs, using about 2 oz. per square yard. It is useless merely to sprinkle the powder on the surface of the soil.

Grey Bulb Rot can be avoided in forced bulbs by using steam sterilized soil in the boxes. If an attack does occur under glass it is essential to sterilize the soil before using it again, preferably by steam or alternatively with chemicals. If the penta-chloro-nitro-benzene powder is used it should be thoroughly mixed with the soil two or three weeks before planting, using 12–16 oz. per cubic yard of soil. New boxes should be obtained or the old ones disinfected. Those who plunge the boxes in ashes in the open before forcing should bear in mind that the sclerotia of the fungus can also remain viable in the ashes, and where an attack has occurred fresh clean ashes must be used the following year.

WISLEY TRIALS, 1949

ANTIRRHINUMS AT WISLEY, 1949

One hundred and forty stocks of Antirrhinums from seed were sent for trial in 1949. The seed was sown, under glass, on February 25, 1949, and the seedlings were planted out, where they were to flower, on May 4, 1949. The Dwarf Bedding and Tom Thumb varieties were planted in rows 15 inches apart; the Intermediate varieties were planted in rows 18 inches apart; the Majestics in rows 21 inches apart, the plants being spaced, in each case, 9 inches apart in the rows. The Tall varieties were spaced 12 inches apart in the rows, 24 inches separating the rows. Fifty plants of each stock were grown. The growth was good and the space available was covered by the plants by the time they were in flower in early July. The varieties had been grouped as far as possible in similar shades according to their types, which gave the opportunity of comparing the merits of closely related stocks. The trial was examined by a sub-committee of Floral "A" Committee on several occasions, who took into consideration when recommending awards the quality of the spike and of the individual flower, and also the trueness of the stocks grown. In no case was a stock containing more than a very small percentage of rogues recommended for an award.

In addition to the above, eight stocks of Antirrhinums claimed to be resistant to Rust Disease (*Puccinia antirrhini*) were sent for trial. These were judged by the sub-committee of Floral "A" Committee mainly on the basis of their true resistance to Rust Disease, as well as flower character and trueness of stock. Five stocks proved to be completely resistant and these were recommended for an Award of Merit as Rust-Resistant varieties. The varieties in question were ORANGE GLOW RUSTPROOF, RUST RESISTANT PINK,

WISLEY BRIDESMAID, WISLEY CHEERFUL and WISLEY GOLDEN FLEECE; these are grouped under their type and colour headings in the report. The number in brackets after the description of each stock is that under which each was grown in the trial.

HABIT DWARF, PROSTRATE

Magic Carpet (raised and introduced by Messrs. Watkins & Simpson, Ltd., and sent by Messrs. Carters Tested Seeds, Ltd., Raynes Park, London, S.W.20). **H.C.** July 6, 1949.—Of dwarf spreading habit, 4 inches high, flower spike short; flowers small of mixed colours. A true and even stock. Also sent by Messrs. Watkins & Simpson, Ltd., a less regular stock. (1, 2).

TOM THUMB VARIETIES

Snowflake (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of dwarf, bushy habit, 6 inches tall, with short flower spikes; flowers small, white. (3).

Canary Yellow (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of dwarf, bushy habit, 6 inches tall, with short flower spikes; flowers small, Sulphur Yellow (H.C.C. 1/1) with a cream tube and throat. (4).

BEDDING VARIETIES (NANUM COMPACTUM)

FLOWERS WHITE

White Reselected (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 6, 1949.—Plant of compact, bushy habit, 10 to 12 inches tall, with very narrow pointed foliage; flower spikes short; flowers small, pure white. A good even stock. (8).

FLOWERS YELLOW

The following variety was grown; CANARY YELLOW (Watkins & Simpson) (9).

FLOWERS AMBER

The following variety was grown: AMBER GEM (Watkins & Simpson) (10).

FLOWERS APRICOT

Apricot Queen (raised, introduced and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham 16). **A.M.** July 18, 1949.—Plant of dwarf bushy habit, 6 to 8 inches tall, with short compact flower spikes and medium-sized flowers, Apricot (H.C.C. 609/1) suffused with gold, tube white. A good even stock. (5).

FLOWERS OF PINK SHADES

Pinkie (sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham). **H.C.** July 25, 1949.—Plant of dwarf, bushy habit, 7 or 8 inches tall, with short, compact flower spikes; flowers small, Neyron Rose (H.C.C. 623), tube white. Also sent by Messrs Watkins & Simpson, Ltd., a less regular stock. (7, 6).

FLOWERS OF ROSE SHADES

Carmine Rose (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** August 4, 1949.—Plant of dwarf, bushy habit, 10 inches tall; flower spikes short, compact; flowers small, Rose Red (H.C.C. 724/2). (12).

The following variety was grown: RICH ROSE (Watkins & Simpson) (11), a mixed stock.

FLOWERS ORANGE-SCARLET

The following variety was grown: ORANGE SCARLET (Watkins & Simpson) (13), a mixed stock.

FLOWERS MAROON

Black Prince (raised and introduced by Messrs. Watkins & Simpson Ltd., and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham 16). **H.C.** July 18, 1949.—Plant of compact, erect habit, 15 inches tall; flower spikes compact; foliage tinged bronzy-purple; flowers of medium size, Ruby Red (H.C.C. 827) flushed Indian Lake (H.C.C. 826). A true even stock. A dwarfer and more compact selection of this variety, and distinct from other senders. (86).

The following varieties were grown: BLACK PRINCE (Watkins & Simpson, Hurst) (87, 85); DARK CRIMSON (Watkins & Simpson) (14).

INTERMEDIATE VARIETIES

FLOWERS WHITE

Aphrodite (raised, introduced and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham 16). **A.M.** July 25, 1949.—Plant of compact, bushy habit, 18 inches tall; flower spikes long, compact; flowers large, white. The largest flowered white in this section. (19).

White Queen (raised and introduced by Messrs. Watkins & Simpson, Ltd., and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham 16). **H.C.** July 6, 1949.—Plant of compact erect habit, 16 inches tall; flower spikes of medium length; flowers of medium size, white, some with a greenish-yellow lip. (16).

The following varieties were grown: INTERMEDIATE WHITE (Carters) (18); WHITE WONDER (Hurst) (15).

FLOWERS OF YELLOW SHADES

Wisley Golden Fleece (raised at Wisley by Mr. D. E. Green, M.Sc., and included in the trial by the Director). **A.M.** July 25, 1949, as a rust-resistant variety.—Plant of compact habit, 16 inches tall; flower spikes of medium length, compact, flowers of medium size, Sulphur Yellow (H.C.C. 1/1); tube white. (88).

Yellow Beauty (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 25, 1949.—Plant of bushy, erect habit, 18 inches tall; flower spikes long, compact; flowers large, Primrose Yellow (H.C.C. 601); tube cream; late flowering. (21).

Golden Queen Reselected (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 25, 1949.—Plant of compact, bushy habit, 16 inches tall; flower spikes of medium length; flowers of medium size, Sulphur Yellow (H.C.C. 1/1); tube yellow. (24).

Intermediate Yellow (raised, introduced and sent by Messrs. Carters Tested Seeds, Ltd., Raynes Park, London, S.W.20). **H.C.** July 18, 1949.—Plant of compact, bushy habit, 20 inches tall; flower spikes long, compact; flowers of medium size. Sulphur Yellow (H.C.C. 1); tube cream. (22).

Jaune Supreme (raised, introduced and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham). **H.C.** July 18, 1949.—Plant of compact, bushy habit, 18 inches tall; flower spikes long, compact; flowers of medium size. Sulphur Yellow (H.C.C. 1); lip touched gold; tube cream. (20).

The following variety was grown: GOLDEN GEM (W. H. Simpson) (23).

FLOWERS AMBER SHADES

Amber Queen (raised and introduced by Messrs. Watkins & Simpson, Ltd., and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road,

Birmingham). **H.C.** July 18, 1949.—Plant of compact habit, 12 inches tall; flower spikes short, very compact; flowers small, upper lobe Marigold Orange (H.C.C. 11/2) flushed gold, lower tube Canary Yellow (H.C.C. 2/1) tinged orange; tube white; lip golden-amber. (25). Also sent by Messrs. Watkins & Simpson, Ltd., a less regular stock. (26).

The following variety was grown: QUEEN OF THE NORTH (Hurst) (17).

FLOWERS CREAM SHADED ORANGE

The following variety was grown: PSYCHE (Daehnfeldt) (27), variable in shade.

FLOWERS OF PINKISH-AMBER SHADES

Picture (raised, introduced and sent by Messrs. Hurst & Son, Ltd., Staple Hall, Houndsditch, London, E.C.). **A.M.** July 18, 1949.—Plant of compact, bushy habit, 18 inches tall; flower spikes long, compact; flowers of medium size, Apricot (H.C.C. 609/1) flushed gold; tube white; lip yellow. (29). Also sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2, whose strain of this variety was **Highly Commended.** (28).

Glint of Gold (raised, introduced and sent by Messrs. Nutting & Sons, Ltd., Merstham, Surrey). **H.C.** July 18, 1949.—Plant of compact habit, 15 inches tall; flower spikes of medium length; flowers of medium size. Shrimp Red (H.C.C. 616/1) flushed gold; tube white. (31).

Prima Donna (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of compact, erect habit, 18 inches tall; flower spikes long; flowers of medium size. Azalea Pink (H.C.C. 618) suffused with Chinese Coral (H.C.C. 614/1) with a golden-apricot sheen; tube white. (57).

FLOWERS WHITE FLUSHED ROSE

The following variety was grown: IRMELIN ROSE (Daehenfeldt), varies in shade (30).

FLOWERS PALE PINK SHADES

Cottage Maid (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 25, 1949.—Plant of compact, bushy habit, 18 inches tall; flower spikes compact, of medium length; flowers of medium size, Rose Pink (H.C.C. 422); tube white. (33).

The following variety was grown: ENCHANTRESS (Watkins & Simpson) (32).

FLOWERS OF PINK SHADES

Roseum Superbum (raised and introduced by Messrs. Watkins & Simpson and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham). **A.M.** July 25, 1949.—Plant of compact habit, 20 inches tall; flower spikes of medium length; flowers of medium size, Neyron Rose (H.C.C. 623) self. (41).

Rust Resistant Pink (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** August 4, 1949, as a rust-resistant variety.—Plant of dense, bushy habit, 22 inches tall; flower spikes long; flowers large, Rose Pink (H.C.C. 427) flushed with Neyron Rose (H.C.C. 623/3) self. (89).

Wisley Bridesmaid (raised at Wisley by Mr. D. E. Green, M.Sc., and included in the trial by the Director). **A.M.** July 18, 1949, as a rust-resistant variety.—Plant of compact, bushy habit, flower spikes long; flowers of mediun size, Phlox Pink (H.C.C. 625/1) self. (90).

Charm (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18 1949.—Plant of bushy habit, 16 inches tall; flower spikes of medium length;

flowers of medium size, Phlox Pink (H.C.C. 625/1) flushed Neyron Rose (H.C.C. 623/1) self. (43).

Nelrose (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2, also sent by Messrs. Hurst & Son, Ltd., Staple Hall, Houndsditch, London, E.C.3). **H.C.** July 25, 1949.—Plant of erect, bushy habit, 20 inches tall; flower spikes of medium length; flowers of medium size. Neyron Rose (H.C.C. 623) self. (40, 39).

Malmaison (raised, introduced and sent by Messrs. Hurst & Son, Ltd., Staple Hall, Houndsditch, London, E.C.3, also sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham). **H.C.** July 25, 1949.—Plant of erect, bushy habit, 22 inches tall; flower spikes long, strong; flowers Neyron Rose (H.C.C. 623/1) flushed Phlox Pink (H.C.C. 625/1) self. (36, 38). Also sent by Messrs. Watkins & Simpson, Ltd., a less regular stock. (37).

The following varieties were grown: FASCINATION (Watkins & Simpson, W. H. Simpson) (34, 35); ROSE SENSATION (W. H. Simpson) (91).

FLOWERS SALMON PINK SHADES

Harmony (sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of compact habit, 24 inches tall; flower spikes long; flowers large, Carmine Rose (H.C.C. 621) suffused with Begonia (H.C.C. 619), margins of lower lobe Amber Yellow (H.C.C. 505). (95). Also sent by Messrs. W. H. Simpson & Sons, a variable stock. (96).

FLOWERS SALMON ROSE

Beacon (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** August 4, 1949.—Plant of compact, bushy habit, 18 inches tall; flower spikes of medium length; flowers of medium size, Neyron Rose (H.C.C. 623) flushed with golden-orange. (42).

FLOWERS OF ROSE SHADES

Gloria (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 25, 1949;—Plant of compact, bushy habit, 18 inches tall; flower spikes of medium length. flowers of medium size, Rose Madder (H.C.C. 23/1) self. (49).

Rose Eclipse (raised and introduced by Messrs. Hurst & Son, Ltd., and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham). **A.M.** July 25, 1939.—Plant of bushy habit, 20 inches tall; flower spikes long; flowers of medium size, Phlox Pink (H.C.C. 625/1). (47).

Wisley Cheerful (raised at Wisley by Mr. D. E. Green, M.Sc., and included in the trial by the Director). **A.M.** July 25, 1949, as a rust-resistant variety.—Plant of dwarf bushy habit, 14 inches tall; flower spikes short; flowers small, Phlox Pink (H.C.C. between 625 and 625/1) with a golden sheen. (92).

Rose Dore (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd, 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 6, 1949.—Plant of compact, erect habit, 16 inches tall; flower spikes of medium length; flowers small, Rose Red (H.C.C. 724/1) self. (50).

Royal Rose (raised, introduced and sent by Messrs. Hurst & Son, Ltd., Staple Hall, Houndsditch, London, E.C.3, also sent by Messrs. Watkins & Simpson, 27 Drury Lane, Covent Garden, London, W.C.2, who share the award). **H.C.** July 25, 1949.—Plant of erect, bushy habit, 20 inches tall; flower spikes long; flowers large, Rose Madder (H.C.C. 23/1) self. (44, 45). Also sent by Messrs. W. H. Simpson & Sons, a much paler selection. (46).

The following variety was grown; ROSE ECLIPSE (Hurst) (48).

FLOWERS ROSY MAUVE

The following variety was grown: MAUVE BEAUTY (Watkins & Simpson) (51).

FLOWERS CHERRY-RED SHADES

Radiance (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 6, 1949.—Plant of very compact, bushy habit, 15 inches tall; flower spikes short; flowers of medium size. Scarlet (H.C.C. 19/1) showing a Carmine (H.C.C. 21/1) reverse, with an orange sheen. (54).

The following varieties were grown: CHERRY RIPE (Watkins & Simpson) (52); LUMINANT (Sharpe) (53).

FLOWERS OLD ROSE

Strawberry Gleam (raised, introduced and sent by Messrs. Charles Sharpe & Co., Ltd., Sleaford, Lincs.). **H.C.** July 25, 1949.—Plant of very compact, bushy habit, 20 inches tall; flower spikes of medium length; flowers medium size, Jasper Red (H.C.C. 018/1) suffused with bright russet orange. (55).

FLOWERS OF SALMON-ORANGE SHADES

Victory (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2, also sent by Messrs. Hurst & Son, Ltd., Staple Hall, Houndsditch, London, E.C.3, whose stock shares the Award). **A.M.** July 25, 1949.—Plant of erect, bushy habit, 20 inches tall; flower spikes long; flowers large, Azalea Pink (H.C.C. 618) suffused with Chinese Coral (H.C.C. 6/4); lip blotched golden-orange. (59, 58).

La Victoire (raised, introduced and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham). **H.C.** July 18, 1949.—Plant of compact, erect habit, 22 inches tall; flower spikes long; flowers large, Azalea Pink. (H.C.C. 618) suffused with Shrimp Red (H.C.C. 616); lip blotched golden-orange. (60).

The following variety was grown: ST. GEORGE (Watkins & Simpson, W. H. Simpson) (56, 63).

FLOWERS OF ORANGE SHADES

Dorothy Silk (raised, introduced and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham). **A.M.** August 4, 1949.—Plant of bushy habit, 22 inches tall; flower spikes long; flowers of medium size, Indian Orange (H.C.C. 713); tube white. (64).

Orange Glow. Rustproof (raised, introduced and sent by Messrs. Hurst & Son, Ltd., Staple Hall, Houndsditch, London, E.C.3). **A.M.** August 4, 1949, as a rust resistant variety. Plant very compact, 18 inches tall; flower spikes of medium length; flowers of medium size. Marigold Orange (H.C.C. 11), tube rose-carmine. (93).

Bonfire (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of bushy habit, 18 inches tall; flower spikes long; flowers of medium size. Fire Red (H.C.C 15), lower lobe suffused with orange. (66).

Orange Glow (raised and introduced by Messrs. Hurst & Son, Ltd., and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of bushy habit, 16 inches tall; flower spikes of medium length; flowers of medium size. Marigold Orange (H.C.C. 11/1) on a base of Nasturtium Orange (H.C.C. 14/2) with a golden sheen. (61).

The following varieties were grown: ORANGE GLOW (Hurst) (62); ORANGE SUPREME (W. H. Simpson) (65).

FLOWERS OF SCARLET SHADES

Advance (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of bushy habit, 16 inches tall; flower spikes of medium length; flowers of medium size, Dutch Vermilion (H.C.C. 717); tube white. (70).

Flame (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of compact, erect habit, 20 inches tall; flower spikes long; flowers large, Signal Red (H.C.C. 719); tube rose. (71).

His Excellency (raised, introduced and sent by Messrs. Hurst & Son, Ltd., Staple Hall, Houndsditch, London, E.C.3). **H.C.** July 25, 1949.—Plant of bushy, compact habit, 18 inches tall; flower spikes of medium length; flowers of medium size. Opening Orient Red (H.C.C. 819) passing to Signal Red (H.C.C. 719) self. (76).

Scarlet Triumph (sent by Messrs. L. Daehnfeldt, Ltd., Odense, Denmark). **H.C.** July 25, 1949.—Plant of compact habit, 20 inches tall; flower spikes of medium length; flowers of medium size. Signal Red (H.C.C. 719) with a sheen of Dutch Vermilion (H.C.C. 717). (73).

Vesuvius (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27, Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of compact, erect habit, 18 inches tall; flower spikes of medium length; flowers of medium size. Dutch Vermilion, lower lobe shaded with gold. (67).

The following varieties were grown: AFTERGLOW (W. H. Simpson) (74); BEDDING SCARLET (W. H. Simpson) (72); DAZZLER (Watkins & Simpson) (69); FIRE KING (W. H. Simpson) (77); FIERY BELT (Watkins & Simpson) (68); SCARLET SUPREME (W. H. Simpson) (75).

FLOWERS OF CRIMSON SHADES

Crimson Velvet (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 25, 1949.—Plant of bushy habit, 18 inches tall; flower spikes long, full; flowers very large, Currant Red (H.C.C. 821) with a sheen of Blood Red (H.C.C. 820). (78).

Welcome (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 25, 1949.—Plant of bushy habit, 20 inches tall; flower spikes of medium length; flowers large, Chrysanthemum Crimson (H.C.C. 824) suffused with Cardinal Red (H.C.C. 822), lower lobe gold. (82).

Eclipse (raised and introduced by Messrs. Hurst & Son, Ltd., and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham). **H.C.** July 18, 1949.—Plant of compact, bushy habit, 20 inches tall; flower spikes of medium length; flowers large. Currant Red (H.C.C. 821) flushed Blood Red (H.C.C. 820), with dark bronzy foliage. (79).

Red Emperor (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of compact habit, 18 inches tall; flower spikes of medium length; flowers large. Blood Red (H.C.C. 820) on a Currant Red (H.C.C. 821) ground. (83).

The following varieties were grown: ECLIPSE (Hurst) (80); WELCOME (Hurst) (81).

FLOWERS CRIMSON AND YELLOW

The following variety was grown: MEFISTO (Daehnfeldt) (84).

FLOWERS MAROON

The following variety was grown: RED ROCKET (Simpson) (94).

MAJESTIC VARIETIES

FLOWERS WHITE

Avalanche (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 18, 1949.—Plant of compact habit, 18 inches tall; flower spikes long; flowers large, white, with a creamy-white lip; a good regular stock (97).

FLOWERS YELLOW

Eldorado (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 25, 1949.—Plant of compact habit, 20 inches tall; flower spikes of medium length; flowers large. Sulphur Yellow (H.C.C. 1/1), tube creamy-white, lip blotched with Aureolin (H.C.C. 2). (98).

FLOWERS APRICOT

Twilight (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** August 4, 1949.—Plant of compact habit, 20 inches tall; flower spikes long; flowers large, upper lobe Apricot (H.C.C. 609/2) heavily suffused with Lemon Yellow (H.C.C. 4/1), lower lobe Lemon Yellow (H.C.C. 4/1); tube Azalea Pink (H.C.C. 618/2). (99).

FLOWERS OF PINK SHADES

The following varieties were grown: FAIR LADY (Watkins & Simpson) (100); ROSELLA IMPROVED (W. H. Simpson) (101).

FLOWERS OF SALMON-PINK SHADES

Delight (raised by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 18, 1949.—Plant of bushy habit, 22 inches tall; flower spikes long; flowers very large, Azalea Pink (H.C.C. 618/1) suffused with Chinese Coral (H.C.C. 614/1), lip blotched golden-yellow. (102).

Evensong (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 25, 1949.—Plant of bushy habit, 22 inches tall; flower spikes long; flowers extra large, Azalea Pink (H.C.C. 618/1) suffused Chinese Coral (H.C.C. 614/1), lip blotched Amber Yellow (H.C.C. 505). (103).

Sunset (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 18, 1949.—Plant of compact, bushy habit, 22 inches tall; flower spikes long; flowers large, Porcelain Rose (H.C.C. 620) heavily suffused with Azalea Pink (H.C.C. 618). (110).

FLOWERS OF ROSE SHADES

Rose Princess (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 6, 1949.—Plant of erect, bushy habit, 22 inches tall; flower spikes long; flowers very large. Carmine Rose (H.C.C. 621) suffused with Begonia (H.C.C. 619/1). (106).

Splendour (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of compact habit, 24 inches tall; flower spikes long; flowers large. Carmine (H.C.C. 21) heavily suffused with Vermilion (H.C.C. 18/1). (104).

The following varieties were grown: ROSAMOND (Watkins & Simpson), a variable stock (107); ROSE MARIE (Watkins & Simpson), a mixed stock (105).

FLOWERS OF CHERRY RED SHADES

Startler (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 25, 1949.—Plant of compact, erect habit, 20 inches tall; flower spikes long, flowers large, Cherry Red (H.C.C. 722/1) slightly flushed with Scarlet (H.C.C. 19/1). (108).

The following variety was grown: FIRE DRAGON (W. H. Simpson), distinct from that of other senders (112).

FLOWERS OF ORANGE SHADES

Orange King (raised and introduced by Messrs. Watkins & Simpson, Ltd., and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham). **H.C.** August 4, 1949.—Plant of compact habit, 22 inches tall; flower spikes long; flowers large, Indian Orange (H.C.C. 713), lip Buttercup Yellow (H.C.C. 5). (109). Also sent by Messrs. Watkins & Simpson, Ltd., a less regular stock. (114).

The following variety was grown: GOLDEN DAWN (Watkins & Simpson) (113).

FLOWERS SCARLET

Fire Dragon (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 18, 1949.—Plant of erect, compact habit, 20 inches tall; flower spikes of medium length; flowers large, Signal Red (H.C.C. 719) self. (111). Distinct from **'Fire Dragon'** of Messrs. W. H. Simpson & Sons.

FLOWERS CRIMSON

Red Chief (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **H.C.** July 25, 1949.—Plant of erect, very compact habit, 18 inches tall; flower spikes of medium length; flowers large, Currant Red (H.C.C. 821/1) shaded Blood Red (H.C.C. 820) self. (115).

FLOWERS OF PURPLE SHADES

Purple King (raised and introduced by Messrs. Watkins & Simpson, Ltd., and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham). **A.M.** July 6, 1949.—Plant of compact, erect habit, 20 inches tall; flower spikes long; flowers large, Peony Purple (H.C.C. 729/1) flushed with Tyrian Purple (H.C.C. 727). (117). Also sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2, whose stock of this variety, which was somewhat paler in colour was **Highly Commended.** (116).

TALL VARIETIES, WITH SINGLE FLOWERS

FLOWERS YELLOW

The following variety was grown: YELLOW KING (Watkins & Simpson, W. H. Simpson) (121, 122).

FLOWERS OF AMBER SHADES

The following varieties were grown: AMOR (Daehnfeldt) (123); C. H. HERBERT (W. H. Simpson) (124); GOLIATH (Watkins & Simpson) (127).

FLOWERS ORANGE

The following variety was grown: ORANGE GLORY (Watkins & Simpson) (125).

FLOWERS OF PINK SHADES

Feltham Beauty (raised, introduced and sent by Messrs. Watkins & Simpson, Ltd., 27 Drury Lane, Covent Garden, London, W.C.2). **A.M.** July 6, 1949.—Plant of erect habit, 28 inches tall; flower spikes long, tapering,

full; flowers large, Phlox Pink (H.C.C. 625/1) flushed Neyron Rose (H.C.C. 623/1); tube pinkish white. (130).

The following varieties were grown: PRINCESS ELIZABETH (W. H. Simpson) (129) ROSE FAIRY (Burpee) (131).

FLOWERS WHITE SHADED ROSE

The following variety was grown: PIERETTE (Daehnfeldt) (128).

FLOWERS APRICOT

The following variety was grown: APRICOT BEAUTY (Watkins & Simpson) (126).

FLOWERS OF SCARLET SHADES

The following varieties were grown: BONFIRE (Watkins & Simpson) (133); HUNTSMAN (W. H. Simpson) (135); KING (W. H. Simpson) (134).

FLOWERS OF CRIMSON SHADES

Crimson Giant (raised, introduced and sent by Messrs. W. H. Simpson & Sons, 209 Monument Road, Birmingham). **H.C.** July 6, 1949.—Plant of compact, erect habit, 28 inches tall; flower spikes full, long; flowers large, bright Currant Red (H.C.C. 821) shaded Blood Red (H.C.C. 820) self. (137).

The following varieties were grown: CRIMSON KING (Watkins & Simpson) (136); MONARCH (Hurst) (132).

FLOWERS OF MIXED COLOURS

The following varieties were grown: GIANT SKYSCRAPER (Burpee) (138); TETRA MIXED (Burpee), a tetraploid variety (139); TETRAPLOID MIXED (Bodger) (140).

TALL VARIETIES WITH SO-CALLED DOUBLE FLOWERS

FLOWERS OF YELLOW SHADES

Burpee Double (raised, introduced and sent by Messrs. Atlee Burpee Co., Philadelphia, U.S.A.). **A.M.** July 25, 1949, as a variety for cutting and market.—Plant of erect habit, 28 inches tall; flower spikes stout, very long, full; flowers large, have extra petals, giving a double appearance, Sulphur Yellow (H.C.C. 1/1); tube French Rose (H.C.C. 520/1). (118).

Floradale Double (raised, introduced and sent by Messrs. W. Atlee Burpee Co., Philadelphia, U.S.A.). **A.M.** July 25, 1949, as a variety for cutting and market.—Plant of erect habit, 26 inches tall, flower stems stout, very long, full; flowers large, have extra petals, giving a double appearance, Sulphur Yellow (H.C.C. 1/1); tube shaded rose. (120).

Lemonade (raised, introduced and sent by Messrs. W. Atlee Burpee Co., Philadelphia, U.S.A.). **H.C.** July 25, 1949, as a variety for cutting and market.—Plant of erect habit, 32 inches tall; flower spikes very long, stout, full; flowers have extra petals, giving a double appearance, large, Primrose Yellow (H.C.C. 601/1) tinted with Canary Yellow (H.C.C. 2); tube white. (119).

EARLY FLOWERING CHRYSANTHEMUMS AT WISLEY, 1949

One hundred and twenty-nine varieties were grown at Wisley in 1949. Of these fifty-three were grown for the first time, having been selected for trial in 1948 by the Joint Committee of the Royal Horticultural Society and the National Chrysanthemum Society.

All the varieties, including the new seedlings, were given the warm-water treatment as a precaution against Eelworm attack.

The rooted cuttings, three of each variety of the spray varieties, twelve of the disbudded varieties, were planted on a fresh site on May 9, 1949. The plants were stopped once, with the exception of the spray varieties; they were disbudded, one flower being allowed to develop on each main growth.

The report indicates the present state of the trials, showing those varieties retained for future judgment and those deleted from the trials.

The trial was inspected by the Joint Committee on August 19, September 7 and 27, 1949, who made their recommendations for Awards as given below.

FLOWERS WHITE

White Bouquet (raised, introduced and sent by Messrs. H. Shoesmith, Ltd., Mayford, Woking, Surrey). **F.C.C.** September 27, 1949.—Described R.H.S. JOURNAL **71,** p. 49. **(A.M.** 1945.)

Cotswold Gem (raised by Mr. W. Avery, introduced and sent by Messrs. Greenyer Bros., Ltd., Broadwinter Green Nurseries, Worthing, Sussex). **A.M.** September 7, 1949, as a spray variety for cutting and garden decoration. —2½ feet; flower stems 15 inches long. Flowers double, 3½ inches diameter, reflexed, pure white.

Snow Queen (raised, introduced and sent by Messrs. H. Shoesmith, Ltd., Mayford, Woking, Surrey). **A.M.** September 27, 1949, as a disbudded variety for cutting and garden decoration.—3 feet. Plant of bushy habit with 24 inch flower stems. Flowers double, incurved, 5 inches diameter, milky-white, solid.

The following varieties have been retained for future judgment: ALFRETON IVORY (Riley), SWAN (Shoesmith).

The following varieties have been deleted from the trials: ALPINE, MARION (**A.M.** 1947), MILLERSDALE (**A.M.** 1946).

FLOWERS CREAM

Hallmark (raised, introduced and sent by Messrs. J. & T. Johnson, Tibshelf, Derbyshire). **A.M.** September 7, 1949, as a disbudded variety for cutting and garden decoration.—3¼ feet. Plant of compact, erect habit with 28 inch long flower stems. Flowers double, reflexed, creamy-white, inner florets deep cream.

Nymph (raised by Messrs. H. Shoesmith, Ltd., introduced and sent by Messrs. Napiers, Stepswater Nurseries, Ltd., Taunton, Somerset). **A.M.** September 7, 1949, as a spray pompon variety for cutting and garden decoration.—2 feet. Plant of compact, bushy habit, with 12 inch long flower stems. Flowers 1¾ inch diameter, double, white, inner florets cream tinged golden-yellow.

The following variety has been deleted from the trials: SHIRLEY CREAM (**A.M.** 1947) syn. CLIFFORD BUCKLEY.

FLOWERS YELLOW

Golden Surprise (raised by Messrs. H. Shoesmith, Ltd., introduced and sent by Mr. W. B. Jackson, Brown Heath Nurseries, Waverton, Chester). **A.M.** September 27, 1949, as a disbudded variety for cutting and garden decoration.—3½ feet. Plant of compact, erect habit with 24 inch flower stems. Flowers double, reflexed, 5 inches diameter, deep bright lemon-yellow flushed Buttercup Yellow (H.C.C. 5).

Phase (raised by Messrs. H. Shoesmith, Ltd., introduced and sent by Messrs. Greenyer Bros., Ltd., Broadwater Green Nurseries, Worthing, Sussex). **A.M.** September 27, 1949, as a disbudded variety for cutting and garden decoration.—3¾ feet. Plant of erect habit with 24 inch long flower stems. Flowers double, reflexed, 5 inches diameter, Aureolin (H.C.C. 3) overlaid with Lemon Yellow (H.C.C. 4).

Primrose Empire (sport from 'Empire White,' sent by Mr. W. B. Jackson, Brown Heath Nurseries, Waverton, Chester). **A.M.** September 27, 1949, as a disbudded variety for cutting and garden decoration.—3 feet. Plant of compact, bushy habit with 26 inch long flower stems. Flowers

double, reflexed, 5½ inches diameter, Empire Yellow (H.C.C. 603/2) inner florets flushed with Aureolin (H.C.C. 3/2).

The following varieties have been retained for future judgment: GOLDEN CROSSLEY (Johnson), INTENSE (Shoesmith), MAGIC (Shoesmith), WHARFEDALE YELLOW (Simpson).

The following varieties have been deleted from the trials: ALFRETON YELLOW (**A.M.** 1947), FLAVIUS (**A.M.** 1947), GOLDEN HARVEST, SUNSHINE.

FLOWERS OF AMBER SHADES

Gold of Ophir (raised by Messrs. Batchelors, Knaresborough, introduced and sent by Mr. R. Thistlewaite, Fair Lane Nursery, Bell Bar, Hatfield, Herts.) **A.M.** September 7, 1949, as a disbudded variety for cutting and garden decoration.—3 feet. Plant of compact, bushy habit with 24 inch long flower stems. Flowers double, reflexed, 4¾ inches diameter, Buttercup Yellow (H.C.C. 5/1) suffused with deep golden-amber.

The following have been retained for future judgment: ORANGE LOVELACE (Johnson).

The following varieties have been deleted from the trials: DOLLARS, GOLDENBLOOM (**A.M.** 1947), RADAR (**F.C.C.** 1947).

FLOWERS WHITE FLUSHED ROSE

The following variety has been deleted from the trials: NEW CRUSADER.

FLOWERS OF PINK SHADES

Fair Maid (raised, introduced and sent by Messrs. J. & T. Johnson, Tibshelf, Derbyshire). **F.C.C.** August 19, 1949, as a disbudded variety for cutting and garden decoration.—Described R.H.S. JOURNAL **72**, p. 204. (**A.M.** 1946).

Pearl Sweetheart syn. **Lily Lambert Sweetheart** (introduced and sent by Mr. C. P. Ward, Bridge Bank, Walton-le-Dale, Preston, Lancs.) **F.C.C.** August 19, 1949, as a disbudded variety for cutting and garden decoration.—Described R.H.S. JOURNAL **73**, p. 124 (**A.M.** 1947).

Day Dream (raised, introduced and sent by Messrs. J. & T. Johnson, Tibshelf, Derbyshire). **A.M.** September 7, 1949, as a disbudded variety for cutting and garden decoration.—Described R.H.S. JOURNAL **73**, p. 124. (H.C. 1947).

Tibshelf Shell (raised, introduced and sent by Messrs. J. & T. Johnson, Tibshelf, Derbyshire). **A.M.** August 19, 1949, as a disbudded variety for cutting and garden decoration.—2¾ feet. Plants of compact, bushy habit, with 24 inch long flower stems. Flowers double, reflexed, 4¾ inches diameter, opening Shrimp Red (H.C.C. 616/3) and passing to Venetian Pink (H.C.C. 420/1) with a pale creamy gold reverse.

The following varieties have been deleted from the trials: BRIDESMAID (**A.M.** 1943), HYDE (**A.M.** 1947), SHELL BOUQUET (**A.M.** 1946).

FLOWERS OF ROSE SHADES

Ladybower (raised, introduced and sent by Messrs. J. & T. Johnson, Tibshelf, Derbyshire). **A.M.** August 19, 1949, as a disbudded variety for cutting and garden decoration.—2¾ feet. Plant of compact habit with 22 inch long flower stems. Flowers double, reflexed, 5 inches diameter, Rhodamine Pink (H.C.C. 527) with a silvery-white reverse.

Patricia (raised, introduced and sent by Mr. H. Lowe, Vicar Lane Nurseries, Tibshelf, Derbyshire). **A.M.** September 7, 1949, as a disbudded variety for cutting and garden decoration.—Plant 2½ feet tall, of compact, bushy habit with 20 inch long flower stems. Flowers double, reflexed, 4 inches diameter, Rhodamine Pink (H.C.C. 527/1) with a creamy-pink reverse.

The following varieties have been retained for future judgment: CAROL (Johnson), FONDANT (Johnson), LADY GAY (Johnson), MAYFORD PINK (Shoesmith), PINK UNA (Dixon).

The following varieties have been deleted from the trials: ANSOM, BARBARA (**F.C.C.** 1947), CHOICE, ROSELIGHT, ROYAL PINK.

FLOWERS OF ROSY-MAUVE SHADES

Hope Valley (raised, introduced and sent by Messrs. J. & T. Johnson, Tibshelf, Derbyshire). **A.M.** August 19, 1949, as a disbudded variety for cutting and garden decoration.—3 feet. Plant of compact, erect habit, with 26 inch long flower stems. Flowers double, reflexed, 6½ inches diameter, Amaranth Rose (H.C.C. 530/1 passing with age to 530/3), reverse, silvery-white.

Mauve Princess (raised, introduced and sent by Messrs. J. & T. Johnson, Tibshelf, Derbyshire). **A.M.** September 7, 1949, as a disbudded variety for cutting and garden decoration.—3¾ feet. Plant of compact, erect habit with 24 to 30 inch flower stems. Flowers double, reflexed, 5½ inches diameter, Mallow Purple (H.C.C. 630/1) on a Cyclamen Purple (H.C.C. 30/2) ground; reverse pale silvery-pink.

The following variety has been deleted from the trials: EMPRESS.

FLOWERS OF SALMON SHADES

Peach Una (sport from 'Una,' introduced by Mr. C. F. Tansey and sent by Mr. H. Woolman, Sandy Hill Nurseries, Shirley nr. Birmingham). **A.M.** September 27, 1949, as a disbudded variety for cutting and garden decoration.—3 feet. Plant of compact, erect habit with 24 inch flower stems. Flowers double, incurved, 5½ inches diameter, soft rosy-salmon with a creamy-golden reverse.

Salmon Lovelace (sport from 'Lovelace,' introduced by Messrs. J. & T. Johnson and sent by Colham Green Nurseries, Ltd., Hillingdon, Middlesex). **A.M.** August 19, 1949.—2¾ feet. Plant of compact, erect habit with 24 inch long flower stems. Flowers double, reflexed, 5 inches diameter, Egyptian Buff (H.C.C. 407) flushed with soft salmon-pink, reverse soft gold.

The following varieties have been retained for future judgment: SALMON BRONZE UNA (Bacon), SALMON UNA (Letch).

FLOWERS OF ORANGE-BRONZE SHADES

Bronze Marie syn. **Bronze Dallas** (sport from 'Marie,' introduced and sent by Mr. P. J. Gilleran, The Lodge, Darland Hall, Rossett, nr. Wrexham). **A.M.** August 19, 1949, as a disbudded variety for cutting and garden decoration.—3 feet. Plant of compact, bushy habit with 22 inch long flower stems. Flowers double, reflexed, 6 inches diameter, dull old gold overlaid with Brick Red (H.C.C. 016/1) with a gold reverse.

The following variety has been retained for future judgment: BRONZE UNA (Jackson).

The following varieties have been deleted from the trials: CRESSET, MAYFORD ORANGE.

FLOWERS OF RED-BRONZE SHADES

The following variety has been retained for future judgment: BRONZE MCLEOD (Colham Green Nurseries).

The following varieties have been deleted from the trials: BRONZE BARBARA, CHALLENGER, COPPELIA (**A.M.** 1940), PRELUDE.

FLOWERS OF RED SHADES

Cavalier (raised, introduced and sent by Mr. E. Riley, Brookside Nurseries, Alfreton, Derbyshire). **A.M.** August 19, 1949, as a disbudded variety for cutting and garden decoration.—3 feet. Plant of compact, bushy habit with 24 inch long flower stems. Flowers double, reflexed, 5½ inches

diameter, bright reddish-bronze flushed Brick Red (H.C.C. 016) with a gol reverse.

Red McLeod (sport from 'George McLeod,' sent by Colham Green Nurseries, Ltd., Hillingdon, Middlesex). **A.M.** September 27, 1949, as a disbudded variety for cutting and garden decoration.—3¼ feet. Plant of erect habit with 28 inch long flower stems. Flowers double, incurved, 6 inches diameter, deep rich chestnut-red with a deep gold reverse.

The following varieties have been retained for future judgment: CRIMSON WONDER (Shoesmith), MERLIN (Shoesmith), RED CAESAR (Woolman), RED ZENITH (Denton), REVENGE (Shoesmith).

The following varieties have been deleted from the trials: GLADIATOR (**F.C.C.** 1944), HURRICANE (**A.M.** 1945), TEMPEST VULCAN (**A.M.** 1939).

FLOWERS OF PURPLE SHADES

Alfreton Yeoman (raised, introduced and sent by Mr. E. Riley, Brookside Nurseries, Alfreton, Derbyshire). **A.M.** September 7, 1949, as a disbudded variety for cutting and garden decoration.—3½ feet. Plant of compact bushy habit with 30 inch long flower stems. Flowers double, reflexed, 5 inches diameter, Rhodamine Purple (H.C.C. between 29 and 29/1), inner florets Fuchsia Purple (H.C.C. 28) with a silvery-pink reverse.

The following varieties have been retained for future judgment: BLENHEIM GEM (Shoesmith), INCURVED ZENITH (Jackson).

The following variety has been deleted from the trials: ROWSLEY.

DAHLIAS AT WISLEY, 1949

Two hundred and sixty varieties of Dahlias were grown in the trial at Wisley. Of these, ninety-eight were grown for the first time, having been selected for trial by the Joint Committee of the Royal Horticultural Society and the National Dahlia Society; the remainder were grown for future judgment or comparison, most of which had received awards in previous years.

The report indicates the classes to which the new varieties have been assigned and those retained for future judgment as well as the varieties which have been deleted from the trials.

The trial was inspected by the Joint Committee on August 18 and September 8, 1949, who made their recommendations for Awards as given below. The names in brackets following the variety denote the raiser, where known.

CLASS III—ANEMONE-FLOWERED

Vera Higgins (raised, introduced and sent by Messrs. J. G. Ballego & Sons, Leiden, Holland). **H.C.** August 18, 1949.—3½ feet. Plant of bushy habit. Flowers 4½ inches diameter, ray florets. Terra-cotta Bronze, disc florets golden-yellow suffused reddish-bronze; free and erect, on 8 inch wiry stems, well above the foliage.

CLASS IVa—COLLERETTE SINGLE

The following varieties have been deleted from the trials: LADY KINDERSLEY, MRS. O. M. COURAGE.

CLASS Vc—SMALL PAEONY-FLOWERED

Morning Glow (raised, introduced and sent by Messrs. J. Cheal & Sons, Ltd., Lowfield Nurseries, Crawley, Sussex). **A.M.** September 8, 1949.—Described R.H.S. JOURNAL **73**, p. 221. (**H.C.** 1947).

CLASS VIa—GIANT FLOWERED DECORATIVE

John Busbridge (raised, introduced and sent by Messrs. J. Stredwick & Son, Silverhill Park, St. Leonards-on-Sea). **A.M.** September 8, 1949.—Described R.H.S. JOURNAL **73**, p. 223. (**H.C.** 1947).

Phoebe Mays (raised, introduced and sent by Messrs. J. Stredwick & Son, Silverhill Park, St. Leonards-on-Sea) **H.C.** September 8, 1949.—3 feet. Flowers 10½ inches diameter, Spanish Orange (H.C.C. 010) tinged Mars Orange (H.C.C. 013); free and erect on 12 to 14 inch stalks, well above the foliage.

The following varieties have been retained for future judgment: ANNA BENEDICT (Ogg), MARGARET COLVIN (Stredwick), WINIFRED STREDWICK (Stredwick).

The following variety has been deleted from the trials: LAVENDER PERFECTION.

CLASS VIb—LARGE FLOWERED DECORATIVE

Justinus Kerner (raised by Mr. V. Berger and sent by Messrs. J. F. Spencer & Son, Hockley, Essex). **A.M.** September 8, 1949.—Described R.H.S. JOURNAL **73**, p. 224. (**H.C.** 1947).

Rosanna (raised, introduced and sent by Messrs. Brown & Such, Ltd., Maidenhead, Berks.). **A.M.** August 18, 1949.—4½ feet. Flowers 9 inches diameter, Phlox Pink (H.C.C. 625) heavily overlaid with salmon-apricot; free and erect, on 8 to 12 inch stalks, well above the foliage.

Bess Smith (of American origin, introduced and sent by Mr. A. T. Barnes, 13 Cardington Road, Bedford). **H.C.** September 8, 1949.—5 feet. Flowers 9 inches diameter, white, inner florets cream; free and erect, on 12 inch stalks well above the foliage.

Cease Fire (raised, introduced and sent by Messrs. J. Stredwick & Son, Silverhill Park, St. Leonards-on-Sea). **H.C.** August 18, 1949.—5 feet. Flowers 8 to 9 inches diameter, Primrose Yellow (H.C.C. 601 fading to 601/3 at tips of florets); free and erect, on 12 inch stalks, above the foliage.

White Guard (raised, introduced and sent by Messrs. J. F. Spencer & Son, Ltd., Hockley, Essex). **H.C.** August 18, 1949.—3½ feet. Flowers 9½ inches diameter, white tinted cream; free and erect, on 7 to 9 inch stalks, well above the foliage.

The following varieties have been retained for future judgment: EILEEN QUINNELL (Stredwick), FRANK K. DOWDEN (Stredwick), LORNA EVANS (Spencer), NANOOK (Topsvoort).

The following varieties have been deleted from the trials: F. E. HOFFER, FRANK SERPA, HAROLD WELLER, MARDEN ASH, NEAREST BLUE, ORTOLAN, STANDFAST, TWILIGHT.

CLASS VIc—MEDIUM FLOWERED DECORATIVE

Deuil du Roi Albert (raised by Mr. R. Troquay and sent by Messrs. Carter Page & Co., Ltd., 52 London Wall, London, E.C. 2). **A.M.** September 8, 1949.—Described R.H.S. JOURNAL **73**, p. 224. (**H.C.** 1947).

Gerrie Hoek (introduced and sent by Messrs. R. Sandford & Co., Barton Mills, Mildenhall, Suffolk). **A.M.** September 8, 1949.—4½ feet. Flowers 6¾ inches diameter, Neyron Rose (H.C.C. 623/1) faintly flushed salmon-apricot at base of florets; free and erect, on 9 to 12 inch stalks, well above the foliage.

Airline (raised, introduced and sent by Messrs. J. Stredwick & Son, Silverhill Park, St. Leonards-on-Sea). **H.C.** August 18, 1949.—5 feet. Flowers 7 inches diameter, white, inner florets creamy-white; free and erect, on 9 to 12 inch stalks, well above the foliage.

Ambassadeur von Kleffens (raised, introduced and sent by Messrs. de Ruyter Bros., Oegstgeest, Holland). **H.C.** August 18, 1949.—5 feet. Flowers 6½ inches diameter, golden apricot suffused with salmon-orange, near Chinese Coral (H.C.C. 614); very free and erect, on 8 to 10 inch stalks, well above the foliage.

Carmenita (raised, introduced and sent by Messrs. Brown & Such, Ltd., Maidenhead, Berks). **H.C.** August 18, 1949.—5 feet. Flowers 6½ inches

diameter, Rose Red (H.C.C. 724/2), tips of florets velvety crimson; very free and erect, on 10 to 14 inch stalks, well above the foliage.

Ice Cream (raised, introduced and sent by Messrs. J. Stredwick & Son, Silverhill Park, St. Leonards-on-Sea). **H.C.** September 8, 1949.—4 feet. Flowers 6½ inches diameter, cream tinted Dresden Yellow (H.C.C. 64/3); free and erect, on 9 to 11 inch stalks, well above the foliage.

Pierre Thiebaut (raised by Mr. R. Chevalier, introduced and sent by Messrs. R. Sandford & Co., Barton Mills, Mildenhall, Suffolk). **H.C.** September 8, 1949.—5 feet. Flowers 6¼ inches diameter, Indian Lake (H.C.C. 826); free and erect, on 4 to 9 inch stems, well above the foliage.

The following varieties have been retained for future judgment: BARRY COTTER (Brown & Such), TEAL (Brown & Such).

The following varieties have been deleted from the trials: BARROWFORD, BRIGHTON, DOROTHY STANTON, IBEX, MARIA ORBAAN, MARY PARRATT, SHEILA MAPPIN (**H.C.** 1947).

CLASS VId—SMALL FLOWERED DECORATIVE

Jean Barnes (raised, introduced and sent by Messrs. Brown & Such, Ltd., Maidenhead, Berks). **A.M.** September 8, 1949.—Described R.H.S. JOURNAL **73**, p. 222. (**H.C.** 1947).

Sachet (raised, introduced and sent by Messrs. Brown & Such, Ltd., Maidenhead, Berks). **A.M.** September 8, 1949.—4½ feet. Flowers 4½ inches diameter, Persian Rose (H.C.C. 628/2); free and erect, on 9 to 15 inch stalks, well above the foliage.

Shirley Westwell (raised and sent by Mr. J. F. Barwise, introduced by Messrs. Wm. Westwell & Sons, The Nurseries, Leigh, Lancs.). **A.M.** August 18, 1949.—4 feet. Flowers 4½ inches diameter, Orient Red (H.C.C. 819) overlaid Signal Red (H.C.C. 719); very free and erect, on 9 to 11 inch stalks, well above the foliage.

Caress (raised, introduced and sent by Mr. A. T. Barnes, 13 Cardington Road, Bedford). **H.C.** September 8, 1949.—4 feet. Flowers 4 inches diameter, Scarlet (H.C.C. 19) with a golden orange sheen; free and erect, on 6 to 9 inch stalks, well above the foliage.

Deepdene (raised, introduced and sent by Messrs. J. F. Spencer & Son, Ltd., Hockley, Essex). **H.C.** September 8, 1949.—4½ feet. Flowers 4½ inches diameter, Ruby Red (H.C.C. 827); free and erect, on 12 inch stalks, well above the foliage.

Gloria van Heemstede (raised, introduced and sent by Messrs. Bakker & Geerlings, Heemstede, Holland). **H.C.** August 18, 1949.—4½ feet. Flowers 4½ inches diameter, Primrose Yellow (H.C.C. 601) flushed Sulphur Yellow (H.C.C. 1); free and erect, on 8 to 12 inch stalks, high above the foliage.

Jescot Jim (raised, introduced and sent by Messrs. E. Cooper & Son, Jescot Nurseries, St. Albans). **H.C.** September 8, 1949.—4 feet. Flowers 4 inches diameter, Primrose Yellow (H.C.C. 601) flushed Sulphur Yellow (H.C.C. 1); free and erect, on 6 to 12 inch stalks, well above the foliage.

Tom Barnes (raised, introduced and sent by Messrs. Brown & Such, Ltd., Maidenhead, Berks.). **H.C.** September 8, 1949.—4¾ feet. Flowers 4½ inches diameter, Roseine Purple (H.C.C. 629/2) on a cream ground; free and erect, on 12 inch stalks, well above the foliage.

The following varieties have been retained for future judgment: BOUNDSTONE ROSE (Parratt), FLORIST (Barwise), PARMA (Brown & Such), PRUNE (Spencer).

The following varieties have been deleted from the trials: ATOM (**H.C.** 1947), BANTAM, BOURNE CRIMSON (**A.M.** 1947), CRIMSON PENNANT, CRUSOE (**A.M.** 1933), FARNHAM GEM, FORTUNE (**A.M.** 1938), FUSE, JESCOT JESS, JESLEA, LOVEBIRD, MOOR PARK, MORNING JOY (**H.C.** 1948), NEWNHAM WHITE (**H.C.** 1948), PHILIP ASLETT, PUFFIN, TRIM, ZINNITA.

CLASS VIIIa—LARGE FLOWERED POMPON

The following varieties have been retained for future judgment: BONUS (Stredwick), LUCK (Stredwick), MY JOY (STREDWICK), REDPOLL (Brown & Such).

The following variety has been deleted from the trials: BABY WILLY.

CLASS VIIIb—SMALL FLOWERED POMPON

Hopette (raised, introduced and sent by Messrs. J. F. Spencer & Son, Ltd., Hockley, Essex). **H.C.** August 18, 1949.—3¾ feet. Flowers 2 inches diameter, Aureolin (H.C.C. 3/1) broadly edged scarlet; free and erect, on 6 inch stalks, well above the foliage.

Roland (raised, introduced and sent by Messrs. J. Stredwick & Son, Silverhill Park, St. Leonards-on-Sea). **H.C.** August 18, 1949.—3½ feet. Flowers 2 inches diameter, Ruby Red (H.C.C. between 827 and 827/1); free and erect, on 6 to 10 inch stalks, well above the foliage.

The following variety has been deleted from the trials: PERCY (**H.C.** 1947).

CLASS IXa—GIANT FLOWERED CACTUS

The following variety has been deleted from the trials: VOLKAERT'S CHAMPION.

CLASS IXb—LARGE FLOWERED CACTUS

Bluelight (raised, introduced and sent by Mr. A. T. Barnes, 13 Cardington Road, Bedford). **H.C.** August 18, 1949.—4 feet. Flowers 8 inches diameter, Phlox Purple (H.C.C. 632/1)) softly flushed Mallow Purple (H.C.C. 630/1); free and erect, on 6 to 9 inch stalks, well above the foliage.

Pauline New (raised, introduced and sent by Messrs. Brown & Such, Ltd., Maidenhead, Berks.). **H.C.** September 8, 1949.—3 feet. Plant of compact habit. Flowers 7 or 8 inches diameter, Primrose Yellow (H.C.C. 601); free and erect, on 12 inch stalks, above the foliage.

The following variety has been retained for future judgment: HOEK'S GLORIE (Hoek).

The following varieties have been deleted from the trials: BETTABRACHT (**H.C.** 1947), MOEDER BALLEGO (**H.C.** 1948), MOTHER OF PEARL, PATRICIA LEACHMAN, SEA SWALLOW.

CLASS IXc—MEDIUM FLOWERED CACTUS

Brother Justinus (introduced and sent by Messrs. R. Sandford & Co., Barton Mills, Mildenhall, Suffolk). **A.M.** September 8, 1949.—4 feet. Flowers 6½ inches diameter, Apricot (H.C.C. 609) passing to Maize Yellow (H.C.C. 607), inner florets Sulphur Yellow (H.C.C. 1); free and erect, on 9 inch stalks, well above the foliage.

Charles Andrews (raised, introduced and sent by Messrs. Brown & Such, Ltd., Maidenhead, Berks.). **A.M.** September 8, 1949.—Described R.H.S. JOURNAL **73**, p. 228. (**H.C.** 1947).

Greta Woodhouse (raised, introduced and sent by Messrs. Brown & Such, Ltd., Maidenhead, Berks.). **A.M.** September 8, 1949.—3½ feet. Flowers 6 inches diameter, Begonia (H.C.C. 619/1) tinted Porcelain Rose (H.C.C. 620/1), inner florets soft apricot-amber with a golden base; free and erect, on 9 inch stalks, well above the foliage.

Hopeful (raised, introduced and sent by Mr. J. F. Barwise, Towneley Nurseries, Burnley, Lancs.). **A.M.** August 18, 1949.—Described R.H.S. JOURNAL **74**, p. 220. (**H.C.** 1948).

Vivianne Coppens (raised by Mr. Florent Braem, introduced and sent by Messrs. J. G. Ballego & Sons, Leiden, Holland). **A.M.** August 18, 1949. —Described R.H.S. JOURNAL **74**, p. 220 (**H.C.** 1948).

Abbot (raised, introduced and sent by Messrs. J. G. Ballego & Sons, Leiden, Holland). **H.C.** September 8, 1949.—3¼ feet. Flowers 7 inches diameter, Currant Red (H.C.C. 821), base of florets overlaid with Blood Red (H.C.C. 820); free and erect, on 12 to 22 inch stalks, well above the foliage.

Doris Pembroke (raised, introduced and sent by Messrs. Brown & Such, Ltd., Maidenhead, Berks.). **H.C.** September 8, 1949.—3½ feet. Flowers 7 inches diameter, Fuchsine Pink (H.C.C. 62711) flushed salmon at base of the florets; free and erect, on 12 inch stalks, well above the foliage.

Good Morning (raised, introduced and sent by Messrs. K. Maarse Dz. Jr., Aalsmeer, Holland). **H.C.** August 18, 1949.—4½ feet. Flowers 6 inches diameter, Phlox Pink (H.C.C. between 625 and 625/1), inner florets creamy-white tinged pale pink; free and erect, on 9 to 12 inch stalks, well above the foliage.

Trajectum (raised, introduced and sent by Messrs. D. Bruidegom, Baarn, Holland). **H.C.** September 8, 1949.—4 feet. Flowers 6 inches diameter, Phlox Purple (H.C.C. between 632 and 632/1); free and erect, on 6 to 10 inch stalks, well above the foliage.

White Superior (raised, introduced and sent by Messrs. K. Maarse, Dz. Jr., Aalsmeer, Holland). **H.C.** September 8, 1949.—3¾ feet. Flowers 6½ inches diameter, pure white; free and erect, on 8 to 12 inch stalks, well above the foliage.

The following varieties have been retained for future judgment: Brooklands (Barwise), Bruidegom's Mystery (Bruidegom), Elizabeth Sawyer (Sandford), Margaret Rose (Weyers), Pelegrina (Weyers), Punctuality (Ballego).

The following varieties have been deleted from the trials: Ami George, Antler, Constellation, Glacier, Glen Mount, Gold Digger, Kannon van Kerkhoven, Noirmoutier, Nora Pickett, Noviet, Restful, Rose Hill (**H.C.** 1948), Sweetness (**H.C.** 1946).

CLASS IXd—SMALL FLOWERED CACTUS

Aldyth Joy (of Australian origin, introduced and sent by Messrs. J. F. Spencer & Son, Ltd., Hockley, Essex). **H.C.** September 8, 1949.—3½ feet. Flowers 4½ inches diameter, Orient Pink (H.C.C. 416/1) on a cream ground, flushed Porcelain Rose (H.C.C. 620/1); free and erect, on 6 to 9 inch stalks, well above the foliage.

The following varieties have been retained for future judgment: Favorita (Bruidegom), Jacqueline (Barnes), Speck (Barwise).

The following varieties have been deleted from the trials: Bessie (**A.M.** 1943), Charming, China Rose, Dainty Rose, Finesse, Firefly, Hylla, Lillibet, Sportsman, Tryst.

CLASS XI—DWARF BEDDING

Ella Britton (raised and sent by Mr. E. J. Barker, and introduced by Messrs. S. O. Brien Baker, Home Meadows Nursery, Martlesham, nr. Woodbridge, Suffolk). **H.C.** August 18, 1949.—20 inches. Plant of erect, compact habit, with brownish-purple stems and foliage. Flowers double, 3 inches diameter, Indian Yellow (H.C.C. 6), suffused with old gold and Fire Red (H.C.C. 15/1) giving a gold tinged orange effect; free and erect, on 8 to 10 inch stalks, well above the foliage.

The following varieties have been retained for future judgment: Jescot Herbert (Cooper), Jescot Merilee (Cooper), Jescot Yellow (Cooper), Topmix (Topsvoort).

The following varieties have been deleted from the trials: Fairy, Jescot Carmen, Jescot Coed, Jescot Kitty, Joy Stubbs, R. J. Cook, Samuel, Mansfield, Shirley Yellow.

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1949

Chrysanthemum 'Cambria' A.M. November 1, 1949. An old gold incurved variety with good solid flowers 5 inches in diameter. Raised in the U.S.A., introduced and exhibited by Colham Green Nurseries, Ltd., Chapel Lane, Hillingdon, Middlx.

Chrysanthemum 'Incurved Edith Alston' A.M. October 18, 1949. An excellent pure white variety which is stated to remain white for a long time. It is of very good form and is a sport from 'Edith Alston.' Raised, introduced and shown by Colham Green Nurseries, Ltd., Chapel Lane, Hillingdon, Middlx.

Chrysanthemum 'Rotary' A.M. November 29, 1949. A fine exhibition variety of good substance and measuring 7 inches across with long narrow slightly curled white petals. There is a very faint trace of green at the top of the flower. Raised, introduced and shown by Messrs. H. Woolman Ltd., Sandy Hill Nurseries, Birmingham.

Chrysanthemum 'William Greenyer' A.M. October 4, 1949. A well-formed silvery rose-pink variety measuring 6 inches across with incurving inner petals. Raised by Messrs. H. Shoesmith, Ltd., introduced and shown by Messrs. Greenyer Bros., Worthing.

Chrysanthemum 'Winn Quinn' A.M. November 1, 1949. A fine Sulphur Yellow (H.C.C. 1/2) incurved variety with broad florets. The flowers measure 5½ inches across. Raised by Mr. H. Featherby, introduced by Messrs. Keith Luxford & Co., and exhibited by Colham Green Nurseries, Ltd., Chapel Lane, Hillingdon, Middlx.

Cyclamen cyprium A.M. October 4, 1949. This autumn-flowering species is suitable only for the alpine house except in the most favoured gardens where plants may occasionally be seen out of doors. The leaves are slightly mottled and of a dark olive-green colour. Its fragrant flowers, which appear intermittently between September and December, are pure white with a distinctly contrasting, light cerise blotch at the base of each petal. Exhibited by M. Ogilvie-Grant, Esq., 71 Kew Green, Kew, Surrey.

Nerine 'Inchmery Elizabeth' A.M. October 18, 1949. This variety is the result of a cross between *Nerine* 'Aerolite' and *N.* 'Red Knight.' The umbel exhibited had twelve Dutch Vermilion (H.C.C. 717/1) flowers measuring 2½ inches across and having a slightly lighter rib down the middle of each perianth segment. Raised and exhibited by E. de Rothschild, Esq. (gr. Mr. B. Hendy), Exbury, nr. Southampton.

Nerine 'Inchmery Kate' A.M. October 18, 1949. This variety resulted from a cross between *Nerine* 'Alice' and *N.* 'Lady Foster.' The umbel exhibited carried eleven flowers and buds. The former measure 3 inches across and are Rose Pink (H.C.C. 427/3) striped very lightly with a deeper shade. Raised and exhibited by E. de Rothschild (gr. Mr. B. Hendy), Exbury, nr. Southampton.

Nerine 'Nena' A.M. October 18, 1949. The umbel exhibited carried eleven open Rhodamine Pink (H.C.C. 527) flowers measuring

2½ to 2¾ inches across and having a deeper rib of colour down the middle of each perianth segment. Exhibited by Col. R. S. Clarke, M.P. (gr. Mr. W. Fleming), Borde Hill, Haywards Heath.

Nerine 'Stephanie' A.M. November 1, 1949. A very beautiful variety raised by the exhibitor as the result of a cross between *Nerine* 'Mrs. M. Praid' and *N.* 'Countess Altamonte.' The plant exhibited bore six splendid umbels each bearing an average of nine Rhodamine Pink (H.C.C. 527/2) flowers measuring 2½ inches across and having a lighter strip down the middle of the segments. Exhibited by Col. R. S. Clarke, M.P. (gr. Mr. W. Fleming), Borde Hill, Haywards Heath.

ORCHIDS

Cypripedium 'Delysia' var. 'Radiance' A.M. November 29, 1949. The dorsal sepal of this well-proportioned flower is mainly crimson-rose, while the petals and labellum are light brown with mahogany-red shading. Exhibited by Messrs. H. G. Alexander, Tetbury, Glos. Raised by crossing *C.* 'Marmion' with *C.* 'Atlantis.'

Odontioda 'Gera' A.M. November 29, 1949. The spike carried nine bright flowers, rose tinted with much crimson-red spotting. The result of crossing *Oda.* 'Uvalda' with *Oda. Pittiae.* Exhibited by Messrs. Charlesworth & Co., Haywards Heath.

BOOK NOTES

"The Elements of Genetics." By C. D. Darlington and K. Mather (Allen and Unwin.) Demy 8vo. Illus. 25*s.*

The authors are to be congratulated on producing this book, which incorporates the whole science of genetics up to the present. Such a book is badly needed by students and by the general reader who are becoming more and more interested in this absorbing science. There are a number of books on the different aspects of cytology and genetics, but in no other is the whole scope brought together in so concise a manner.

Each chapter is short and at the end of each chapter is a bibliography for further study.

The work is divided into three parts. The first shows how the material lying in the cells of animals and plants determines their heredity. It deals with the chromosome mechanism and the Mendelian laws with a clear description of how certain hereditable factors are linked in their inheritance and how the biometrical technique can help the plant breeder in his endeavours to improve the performance of crops and animals. The last two chapters of this part describe how changes such as sports or mutants come about by polyploidy and other means.

The second part explains how the material in the cells is organized and also the theory of polygenes and major genes. The chapters on the cytoplasm of the cell and how it contains plastids, plasmagenes, and their relation to virus and to something the authors have named "provirus" is of major importance. It shows how some diseases of plants are due to the plasmagenes and how the organisms are inherited, causing "rogues" in peas and other plants, and "yellows" in strawberries, but virus diseases are caused by infection; yet there is something in between which, for instance, causes the yellowing or variegation in Abutilon, privet and other plants which is not inherited nor caused by infection but is caused by artificial filtration such as grafting. The difficulties in growing the Apple 'Lord Lambourne' appear to be due to this provirus.

The third part deals with the different breeding systems of outbreeding and inbreeding in Nature. It describes the elaborate devices that exist to discourage self-fertilization such as the incompatibility of pollen among Sweet Cherries and the wonderful "pin" and "thrum" structure of the style and anthers in the common Primrose.

The next chapters show how the combination of genetics and environment enable species or races to survive and further how the breakdown of continuity may come about. It may happen in several ways by geographical restrictions, as with Darwin's finches on the Galapagos Islands, or by insects having a predilection for certain flowers as in species of Antirrhinum, or again by polyploidy. In plants polyploidy can produce a true breeding hybrid which is in fact a short cut to the creation of a new species. So these forms of discontinuity in genera may mark how "species, genera or even families" have developed. This theory of evolution will be of particular interest to the systematist. All the earlier chapters on the principles and mechanism of genetics lead up to the value of the genetic theory for man and mankind, in medicine, in social inheritance, in race theory and culture and language. The concluding chapter deals with the future of genetics.

The book is excellently printed. The glossary might be expanded to include such terms as "antigen" and "antibody." The book needs study to understand the mass of facts it contains. It will be invaluable to breeders of plants and animals, to the systematist and to those who treat the diseases of man.

F. C. STERN

"Manual of Cultivated Plants." By L. H. Bailey. Revised ed. 8vo. 1116 pp. Illus. (Macmillan Co., New York, 1949.) £6 10*s*. 0*d*.

This book is intended to provide a ready means for the identification of the species in the usual domestic flora of the continental United States and Canada. It is cast in the form of a flora and contains 5,347 botanical descriptions of species grown in the area it covers and incidental references to many others. The first edition published in 1924 contained 3,665 species, and besides the additions made there is considerable re-arrangement in this edition and of course a good many name changes. The name changes are due in several instances to the division of older genera into smaller groups, and in others to the discovery of prior names, or to a revaluation of old specific descriptions. Some prior specific names have not been taken up, whether because they have been overlooked or because they have not proved acceptable to the authors is not clear. Most of the species described are grown in British gardens but the list is by no means exhaustive and with that we can have no quarrel, but so far as it goes it is very well done and should prove very useful to American horticulturists. It does not deal, or attempt to deal, with horticultural varieties, nor does it deal in any way with cultivation. The illustrations consist of outline drawings showing botanical details of representative species in the genera dealt with. The common American names of many plants are given, usually those adopted in the American *Standardised Plant Names* though without contracting several words into one as is often done there, and the derivation and pronunciation of the botanical names is indicated. A copious index occupying 86 pages each with 3 columns of small print makes reference easy. Paper, type and general lay-out are, as one has learnt to expect from this publisher, all that can be desired, but the book is too heavy to use in the garden, it must be reserved for the desk.

"On the Making of Gardens." By Sir George Sitwell. With an introduction by Sir Osbert Sitwell and decorations by John Piper. Royal 8vo. (Dropmore Press). 30*s*.

Sir George Sitwell had a real understanding of those factors which are important in the making of any garden, particularly the large one. It is probable that he hardly contemplated the small garden of to-day. He had an Olympian approach to the subject which I find very refreshing to-day, as refreshing as the right use of water and shade in the garden, factors which he understood so well. This approach is perhaps best exemplified in this quotation, one of the keys to the book. "This, then, leads up to what I believe to be the great secret of success in garden making, the profound platitude that we should abandon the struggle to make nature beautiful round the house and should rather move the house to where nature is beautiful." I often yearn to do this. The gardens which please us most, Bodnant, Hidcote, Caerhays, to quote three only, have this advantage of a fine natural situation to which the garden making is complementary. The naturalistic and wild styles of gardening, introduced so ably by William Robinson, have held the English field now for the last thirty years to the virtual exclusion of the more formal element, regarded in earlier centuries as the paramount element. Perhaps we should be due for a change again, a swing of the pendulum, although it is a swing made difficult by modern economic conditions. However, there are no better gardens from which to learn these master precepts of design than the great Italian ones and Sir George makes us want to visit them again. Unfortunately it is doubtful if many now are in the same state as when he wrote.

Sir George's sentences are long and flowing as the water he loved, rich with luscious and fine sounding adjectives as the Italian gardens were rich with Cypresses, masonry and urns, but the book has given me, at any rate, much pleasure.

Sir Osbert Sitwell records that his father was disappointed with the appearance of the first edition in 1909. This edition also does not seem as attractive as it might be, with the ill-balanced proportions of type area to page, the massive blocks of solid unrelieved colour which form a background to the decorations and the fussy restless type used on the title page for the title. Peace and proportion were the attributes Sir George regarded most in a garden. They are also needed in the typography of a book. Few, however, would cavil at the richness of the hand made paper.

P. M. SYNGE

"Delphiniums." By Frank Bishop. 144 pp. Illus. (Collins.) 10*s.* 6*d.*

This book is easy to read, contains much useful information, and some of the illustrations are quite attractive. Fortunately no attempt has been made to dogmatize on the origin of the hybrid Delphinium which remains in obscurity. The detailed cultural instructions traverse the whole gamut of operations including preparation of the soil, propagation by seeds and cuttings, growing for exhibition, etc., and amateur growers who desire to make crosses will find the chapter on breeding useful as it contains an elementary outline of the Mendelian theory. Intending growers of Delphiniums should not be deterred from doing so after reading the chapter of ten pages on "Diseases and Pests," as undue emphasis has been placed regarding the losses caused by 'Black Rot,' etc. It is, however, wise to stress the necessity to guard Delphiniums against their greatest enemy, the slug.

Readers will not fail to realize that the author has been an ardent amateur exhibitor as his instructions on the preparation and transport of spikes for showing could only have been written by one with practical experience.

Are there only a "few" Delphiniums resistant to mildew?

Reference is rightly made to the fact that American strains lack perenniality. An important point which native hybridists will do well to record.

It would appear unwise to include in a book of this sort a list of modern varieties; what is "modern" to-day, may be "ancient" to-morrow where varietal improvement is so rapid.

Amateur growers will gain much knowledge from reading Mr. Bishop's book and professional growers will peruse it with interest.

ALLAN G. LANGDON

"Delphiniums. Their history and cultivation." By G. A. R. Phillips. 114 pp. Illus. Cr. 8vo.

"Gladioli." By A. J. Macself. 114 pp. Illus. Cr. 8vo. (Eyre and Spottiswoode). 6*s.* each.

These two useful little volumes in Mr. Macself's series of "Home Garden Books" were first published in 1933 and 1932 respectively. They have since been revised and brought up to date in the light of modern achievements in the raising of new varieties of these two genera. Each book follows roughly the same plan, dealing with history, species, culture, exhibitions and diseases. There is a complete list of Delphiniums which have received awards from 1870–1945 and a diary of Delphinium cultural operations month by month. There is a useful list of Gladiolus species but a list of modern recommended Gladiolus varieties for the amateur, apart from the commercial grower, seems an omission which might be worth rectifying in future editions.

"The Living Soil." By E. B. Balfour. 270 pp. Illus. Demy 8vo. (Faber & Faber). 15*s.*

This is the eighth edition of Lady Eve Balfour's most notable book which first appeared in 1942 and which has since been revised considerably. The case for the value of compost making in garden operations finds general acceptance to-day and the majority of gardeners now make their compost heap a regular part of the year's operations. The relation of compost grown food to general health is a matter of more controversy and those interested cannot do better than to read this book which is certainly very much alive and written with vigour and probably achieves the difficult task the author set herself of writing both for the specialist and the layman. Its sub-title is "evidence of the importance to human health of soil vitality, with special reference to national planning." It is as much a political book as a biological one and should be read as such but no one can deny the need for understanding between the two.

"Roses." By Bertram Park, O.B.E. 141 pp. Illus. Cr 8vo. (Pitman) 10s. 6d.

Mr. Bertram Park is one of the foremost growers and exhibitors of Roses in the country and as such his little book will be welcomed by Rose growers. It is a practical book and Mr. Park has the gift of explaining both his theories and his practice clearly and concisely.

He is also a very skilled photographer and most of the photographs in this book are his own work. There are four plates in colour. The book is addressed modestly to those "who love Roses but who perhaps have not had sufficient experience in growing them at their best." It should be a very great help to them, but I anticipate that it will be read with enjoyment and interest as well by the expert rosarian. The whole subject seems to be covered in a very small space and there is a valuable selection of modern hybrid tea roses which should help many to select through the manifold varieties of the Rose catalogues. One of the most encouraging remarks in the book is that in the last thirty years fragrance has gradually been bred back into our new Roses.

"Fruit Culture." By A. H. Hoare. 347 pp. Illus. (Thomas Nelson & Sons, Ltd.) 12s. 6d.

This is a well-planned book, essentially of a textbook character on scientific lines, and to some extent presupposes on the part of the reader a certain amount of botanical knowledge. The author endeavours in the relatively small compass available to him to cover a very wide field, "dealing with the whole range of edible fruits cultivated by man." It is inevitable, therefore, that the treatment of some of the fruits must be of a somewhat superficial nature; but he has been, on the whole, successful in compressing a deal of informative material in the pages of this book. For the serious student requiring further information there are references to other books, reports and papers at the end of appropriate chapters "for further reading."

The first part of the book is devoted to general principles. The second part deals with the individual fruits. "The book is written mainly to meet the point of view of the commercial operator," but there is a short chapter on "Fruit Culture in the Home Garden."

The author first gives an account of the botanical structure of the common types of edible fruits and discusses their dietetic value. A short review of the statistical position as revealed by the 1944 census of trees and planted acreage is included. Various methods of propagation are then explained, and there is a useful chapter devoted to the factors influencing crop production. Nutritional requirements and some of the common element deficiencies are discussed. Then follows a chapter on the genetics of fertility and incompatibility, this complicated biological subject being explained in a lucid manner. It might have been better to have avoided the introduction of the term *synapsis*, which has not been explained in the short account of reduction division (*meiosis*). Planning and planting, plant health and protection against pests and diseases, pruning, orchard management, and the economics of fruit production, have their special chapters in this first part of the book, the last-mentioned subject dealing with marketing, production costs, and the general finance of fruit-growing.

Part II of the book deals in detail with the different kinds of cultivated fruits. The inclusion of tropical and sub-tropical fruits adds interest for the general reader. A chapter on the salad fruits is an innovation in a book of this sort, and there is also one on fruit for canning. The commoner pests and diseases of fruit crops in Britain are then briefly dealt with, and there are useful appendices of special interest to those about to take up commercial fruit-growing.

The photographic illustrations might well have been more numerous; as a whole they are rather disappointing, some, indeed, having little or no message to convey.

We should like to have seen the chapter on "Fruit Culture in the Home Garden" expanded somewhat, the subject being covered in rather brief fashion in about five pages; no doubt the exigencies of space had to be considered. One particularly good piece of advice given is that "the first thing the home fruit-grower must do is to secure correct and sound planting material." "It is the haphazard acquisition of planting material about which nothing is known that is more often than not a waste of time and money." The selection of Apple varieties suggested for the home garden is a poor one, those mentioned being, with perhaps one exception, the sorts that can in ordinary times be purchased in the shops; they are given as an example of a "range of varieties which would provide apples from July to March." It would have been better to have given a selection of choice sorts to cover an even longer period.

There are a few what might be termed typographical errors or repetitions which will no doubt be rectified when another edition has to be printed.

All fruit-growers, professional and amateur, will find much interesting and informative matter in this book; and to the student who is considering taking up fruit-growing commercially it will present a profitable introduction to the subject.

HOWARD H. CRANE

"Fruit-Growing for Amateurs." Edited by N. P. Harvey. 128 pp. Illus. (Published by Plant Protection Ltd. and distributed by Simpkin Marshall (1941) Ltd.) 8*s.* 6*d.*

This is a nicely got-up book, "the first of a new series of horticultural publications by Plant Protection Ltd., designed to acquaint gardeners both with traditional methods of good cultivation and the latest achievements of scientific research." Its aim is "to cover the general cultivation of tree and bush fruits, mainly from the standpoint of the gardener," and it does not purport to "offer an exhaustive treatment of so wide a subject."

The cultivation of the popular tree fruits and soft fruits is dealt with in turn. Separate chapters are devoted to Apples, Pears, and Plums respectively. Then come "notes on the colour plates" and the colour plates themselves. These are followed by a separate chapter on Cherries. Then Peaches, Nectarines and Apricots share a chapter, followed by a short one on Medlars, Quinces and Mulberries.

The cultivation of "black, red and white Currants" is covered under one and the same chapter. In view of the widely differing treatments required by Black and Red Currants, from propagation onwards, we think it would have been better if Black Currants had been given a chapter to themselves, or at any rate to have had the chapter more distinctly divided; this would avoid risk of confusion on the part of the amateur new to fruit-growing. Gooseberries, Raspberries and Strawberries are given a chapter each. Another chapter is devoted to Blackberries, Loganberries and Hybrid Berries. The final chapter in the book deals somewhat ambitiously with Cobnuts, Filberts, Walnuts, Figs and Grapes. Although this last chapter is appropriately subdivided and the information given under each heading is brief—Grapes, for instance, being dismissed in just over a page—we think a separate arrangement would have been preferable. There are short historical notes on each fruit dealt with, which add to the interest.

References to a "complete fertilizer" are made in the text; we suggest that the amateur would like to know how to make up such a manurial compound and to have details of the ingredients. And would the novice know what is meant by "a dressing" of sulphate of ammonia or nitro-chalk without some reference to actual quantity or area covered?

The coloured illustrations—from original water-colour sketches—of pests and diseases are a feature of the book. They are carefully executed and well reproduced, giving an excellent representation of those enemies the amateur is most likely to meet. There should be no difficulty whatever in identifying every one of them. These illustrations are captioned and have a cross-reference to the description in the text.

Having regard to the importance of pest and disease control, which is well stressed in the chapter on Apples, it might have been well to have brought in the spraying routine as part of the cultural treatment.

There are also some coloured plates from water-colour sketches of six Apple varieties: 'Orleans Reinette,' 'Blenheim Orange,' 'Cox's Orange Pippin,' 'Laxton's Superb,' 'Lord Derby,' and 'Bramley's Seedling.' These are admirable; there may be some criticism, however, that the colouring of Cox is not truly representative of that variety.

The other illustrations take the form of line drawings or diagrams in interpretation of the text. The illustrations are, perhaps, less numerous than we are accustomed to in many books of this sort, but they are sufficient to bring out relevant and important points.

HOWARD H. CRANE

"A List of Abbreviations of the Titles of Biological Journals." 26 pp. (Issued by the Biological Council, obtainable from H. K. Lewis & Co. Ltd.) Price 2*s.* 6*d.*

This booklet gives a list of the standard abbreviations in a handy form of the titles of biological journals and should prove extremely useful to those engaged in the preparation of scientific papers, as well as to Editors. It was prepared as the result of a meeting of Editors of the principal journals in the biological field and is based largely on the abbreviations given in the World List. It has been prepared by Mr. R. W. Marsh, Editor of the *Annals of Applied Biology*.

ERRATA

"Flora of Gloucestershire," page 552, Vol. 74, *December*, 1949

The Hon. Librarian of the Cotteswold Naturalists Field Club has asked us to state that the price of this volume has now had to raised to three guineas and that the address from which it may now be obtained is the City Library, Gloucester.

FIG. 34, *February*, 1950, Vol. 74

It is regretted that the caption underneath this plate incorrectly stated that it was a Fuchsia cutting. The plate showed a Dahlia cutting attacked by the Broad Mite.

The contents of this volume are copyright. For permission to reproduce any of the articles application should be made to the Council

ORCHID COMMITTEE—Mr. GURNEY WILSON, F.L.S., V.M.H., in the Chair, and eleven other members present.

Awards Recommended:

Silver-gilt Banksian Medal

To Messrs. Sanders, St. Albans, for a group of Orchids.

Silver Banksian Medal

To Messrs. Charlesworth & Co., Haywards Heath, for a group of Orchids.

Award of Merit

Cypripedium 'Crimea' ('Balaclava' × 'Redstart') (votes 9 for, 0 against), from Messrs. Sanders, St. Albans.

JOINT PERPETUAL FLOWERING CARNATION COMMITTEE—Mr. Geo. MONRO, V.M.H., in the Chair, and eleven other members present.

Exhibits

'Allwood's Golden Glory' (to be seen again), 'Allwood's Prolific' and 'Allwood's Market Pelargonium,' all shown by Messrs. Allwood Bros., Ltd., Wivelsfield Nurseries, Haywards Heath, Sussex.

NOVEMBER 29, 1949

SCIENTIFIC COMMITTEE—Mr. E. A. BOWLES, M.A., F.L.S., F.R.E.S., V.M.H., in the Chair, and eight other members present.

Moles and Worms.—Mr. C. H. Hooper drew attention to statements in the press that moles made hoards of earth-worms, immobilizing them by biting their heads, and that worms so treated remained alive for some time and eventually grew a new anterior end and, if that had been damaged, a new tail. From enquiries which had been made as to the authenticity of this it had been learned that the source of the story was a paper published in the *Proceedings of the Zoological Society*, vol. 118 (1948), pp. 356 to 363, by Mr. A. C. Evans of Rothamsted. Doubt had previously been cast upon the fact of hoarding and also upon the ability of worms to regenerate parts. Mr. Evans had found worms in the mole hills in which regeneration was beginning and assumed it would go on if the worms were not disturbed. Dr. Parker, of the British Museum, was reported to have said that in the Family Lumbricidæ, to which most of the British earthworms belong, considerable powers of regeneration are to be found. If the posterior end is cut off up to about fifteen segments a completely new tail may be grown. If only a few segments, up to about four, of the anterior end are cut off the worm may grow a completely new head in about seventeen days, but if more an imperfect head may be formed. The maximum amount is fifteen segments but then, as the sexual organs will have been cut off, it will be unable to reproduce itself; the wound, however, will heal, a mouth will develop and the worm will be able to continue its other activities and to move about.

Various Conifers, etc.—Commander Gilliland sent a remarkably fasciated leader, one of six on the plant, of *Cryptomeria japonica cristata* and a fasciated leader of *Sciadopitys verticillata* from a plant about 12 feet high. He also sent shoots of a species of Callitris, *Cupressus lusitanica*, *C. lusitanica flagellifera* and *Nothofagus fusca*. The following collected from Mr. E. H. Walpole's garden at Mt. Usher, Co. Wicklow, also came from him. Cones of *Taxodium distichum* and *Cunninghamia lanceolata*, *Athrotaxis selaginoides*, and a shoot of *Tetraclinis articulata* with many male cones shedding pollen. The last plant was severely damaged by frost in 1945 but has recovered and is now about 20 feet high.

Maize with mixed inflorescence.—Prof. Stoughton showed a specimen of Maize with several female flowers developing grains on a shoot from the base of the male inflorescence.

Narcissi.—Mr. C. C. Mountfort, of Woodside, Ferndown, Dorset, sent flowering specimens of the Moroccan species, *Narcissus Broussonetii*, remarkable for the primitive condition of the corona, and the green flowered *N. viridiflorus*. Mr. Bowles drew attention to the stages in development of the Narcissus corona as seen in various species and fully set out in his Handbook of Narcissus.

Gentiana fascicularis.—Mr. J. R. Sealy, of Kew, has now determined the plant shown on September 7, 1948, from Wisley, and raised from Assam seed, KW 16020, to be *Gentiana fascicularis*, figured in *Bot. Mag.* 4838 as *Crawfurdia fasciculata*. See *Kew Bulletin*, 1949, pp. 311–317.

FRUIT AND VEGETABLE COMMITTEE—Mr. A. CHEAL in the Chair and 21 other members present. Mr. F. J. CHITTENDEN was in attendance.

Exhibits

Awards Recommended:

Silver Hogg Medal

To Shenley Hospital, nr. St. Albans, Herts., for a Group of Apples.

Hogg Medal

To Messrs. Daniels Bros. Ltd., Norwich, for a Group of Apples.

Other Exhibits

Apple Seedling from H. F. S. Bale, Esq., Hollytop, 22 Greenhayes Avenue, Banstead, Surrey.

Apple 'Laxton's Royalty', from J. H. Loudon, Esq., Olantigh Gardens, Wye, Ashford, Kent.

Apple 'Marian Seymour,' from Miss W. M. Dibdin, New Flowers, By Sonning Bridge, Sonning, Reading, Berks.

Apple 'Goodwins' Russet,' from R. A. Goodwins, Esq., 131 Clarence Road, Four Oaks, Sutton Coldfield, Birmingham.

Apple 'Soutermere,' from J. W. Souter, Esq., 3 Sicklemill Cottages, Haslemere, Surrey.

Apple Seedling from F. James, Esq., 34 Brighton Road, Aldershot, Hants.

Apple 'Grain's Ideal,' from Mrs. C. Grain, Montclare, Lydd Road, Camber, nr. Rye, Sussex.

Apple Seedling, from R. A. Cumberland, Esq., Felmersham, Bedford.

FLORAL COMMITTEE A—Mr. G. W. LEAK, V.M.H., in the Chair and eighteen other members present.

Awards Recommended:

Gold Medal

To Messrs. Blackmore & Langdon, Bath, for an exhibit of Cyclamen.

To Messrs. Sutton & Sons, Ltd., Reading, for an exhibit of Cyclamen.

To Messrs. H. Woolman, Ltd., Birmingham, for an exhibit of Chrysanthemums.

Silver-gilt Flora Medal

To Messrs. A. G. Vinten, Ltd., Balcombe, for an exhibit of Chrysanthemums.

Silver-gilt Banksian Medal

To Dales Nurseries, Tarvin, for an exhibit of Chrysanthemums.

To Messrs. Keith Luxford & Co., Sawbridgeworth, for an exhibit of Chrysanthemums.

To His Grace the Duke of Norfolk (Gr. Mr. L. Wiseman), Arundel Castle, Sussex, for an exhibit of Begonias.

Silver Flora Medal

To Messrs. Allwood Bros., Ltd., Haywards Heath, for an exhibit of Carnations.

To Mr. John R. Bell, Cross in Hand, for an exhibit of Chrysanthemums.

To Mr. A. G. Campbell, Dunstable, for an exhibit of Cyclamen.

To Messrs. Greenyer Bros., Ltd., Worthing, for an exhibit of Chrysanthemums.

To Messrs. E. J. Horton & Son, Dunstable, for an exhibit of Cyclamen.

To Messrs. E. Webb & Sons (Stourbridge) Ltd., Stourbridge, for an exhibit of Begonias and Cyclamen.

Silver Banksian Medal

To Messrs. Napier, Ltd., Taunton, for an exhibit of Chrysanthemums.

To North Mymms Market Gardens, Hatfield, for an exhibit of Cyclamen.

To Messrs. Toogood & Sons, Ltd., Southampton, for an exhibit of *Primula obconica* 'Giant Hybrids.'

Flora Medal

To Messrs. G. & A. Clark, Ltd., Dover, for an exhibit of Chrysanthemums and shrubs.

Banksian Medal

To Lynwood Nurseries, Teddington, for an exhibit of Primulas, Azaleas and Cyclamen.

Award of Merit

To Chrysanthemum 'Rotary' as a variety for exhibition (votes 12 for, 0 against), from Messrs. H. Woolman, Ltd., Birmingham.

Other Exhibits

Chrysanthemums 'Freda Perry,' 'Orange Girl,' 'Prescilla,' 'Red Warrior,' from Messrs. H. Woolman, Ltd., Birmingham.

Chrysanthemum 'Leah's Green Glory' (syn. 'Madame Edmund Roger') from E. Leah, Esq., Fairwarp.

Chrysanthemum 'Primrose Favourite' from G. W. Darby, Esq., Welwyn.

Narcissus Poetaz 'Cragford', from Messrs. G. Zandbergen-Terwegen, Sassenheim, Holland.

Violas and Roses, from Mr. C. A. Jardine, Feltham.

FOR SPRING PLANTING

A wide selection of top quality DAHLIAS,
CHRYSANTHEMUMS, BORDER PLANTS,
FLOWERING SHRUBS, *and* FRUIT TREES
is offered in

Ryders' **1950 SPRING PLANT GUIDE**
FREE AND POST FREE

To Dept. R. J. RYDER & SONS (1920) LTD., ST. ALBANS. Please send—
(1) Copy of your SPRING GUIDE (2) Copy of your 1950 Seed Book
Cross out either if not required

Name.....

Address.....

.....

A master of mowing . . .

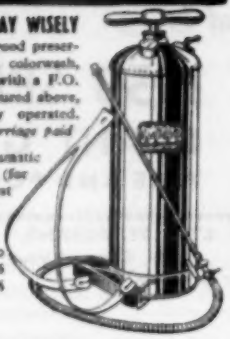
There's something of a work of art about a perfect lawn . . . a quality that makes it more than a mere stretch of grass. As guardian of such quality, Shanks "Firefly" is unexcelled. Some of the world's most famous lawns are in its care, their perfection constantly maintained by its close, precise, even cut. With its smoothly-controlled action and high mowing capacity, the motor-driven "Firefly" is outstanding for keeping fair-sized lawns in first-class trim.

SHANKS "Firefly" MOTOR MOWER

ALEXANDER SHANKS & SON, LTD., DENS IRON WORKS, ARBROATH
London Office: 66, Victoria Street, S.W.1. (*Member of the Technically Controlled Castings Group*)

SPRAY WELL, SPRAY WISELY

Apply whitewash, wood preservative, disinfectant, colorwash, speedily and well, with a F.O. 6 gal. machine, pictured above, lever action, easily operated. Price £3 16 0. *Carriage paid*



F.O. "Kent" Pneumatic Knapsack Sprayers (*for spraying strongest sulphur washes*).

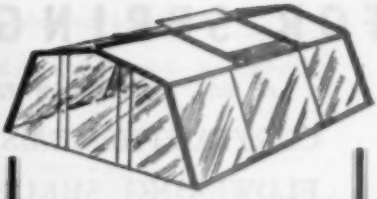
Three sizes—

2½ gals. - £6 18 0
3½ gals. - £8 12 6
4 gals. - £10 16
Carriage paid.

Please write us.

THE FOUR OAKS SPRAYMACHINE CO.,
Belroy Works, FOUR OAKS, nr. Birmingham
Makers & Exporters of Spraying Machines since 1898

A.O.



S.C.F. GROWERS FRAME

(New Type)

The Frame you MUST have

- Rigid — — Strong — — Light — — Portable
- Ensures Maximum Light and Easy Ventilation.
- Sliding Glass Top and Sides.
- No clips, screws, bolts or nuts.
- Will help you to get produce to market IN TIME TO GET THE BEST PRICES.

Each frame covers an area of 27 sq. ft. Soundly built of ½ in. thick welded steel to ensure long and satisfactory service. Size: 6 ft. long × 4 ft. 4 ins. wide × 23 ins. high (in centre of beam).

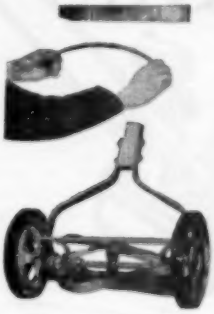
Minimum order of seven frames. Complete with clear glass top and sides, 70/-, each delivered. Glass ends in metal frames, 30/- per pair. One frame complete with glass and metal ends, with glass £6 15·6 delivered.

Send for fully Descriptive leaflet to :—

POULTMURE LTD.

Dept. R.N.S., 5, College Rd., Harrow, Mdx.

The FLEXA Lawn Mower



for longish Grass on uneven ground as well as for ordinary Lawns. Surprisingly easy to push. Used in Wisley Gardens for many years.

Please write for particulars to :—

The FLEXA Lawn Mower Co. Ltd.
Guildford Road, Woking, Surrey

STAGGERING

RESULTS

"Please forward by return 28 lbs. Flexible Earth. A friend tried some last year with astounding results and I want to get some seeds sown to try and beat his efforts."—Mr. J. W. Hagan, 4, Pitville Road, Liverpool, 18.

14 lbs. 6/6 ; 28 lbs. 13/- ; 56 lbs. 23/6 ; 1 cwt. £3·2·0. Carriage paid to nearest station.

CORNISH · FLEXIBLE EARTH · CO

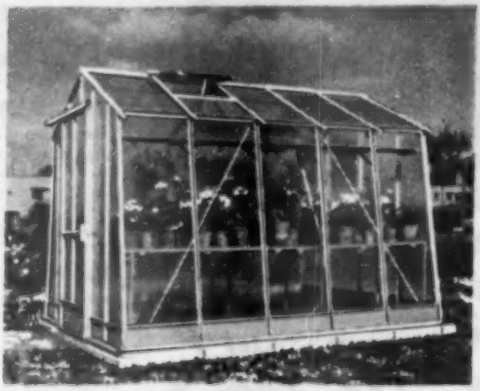
52, LANIVET, BODMIN, CORNWALL

CRITTALL GREENHOUSES

RUSTLESS

Height: Ridge 7ft. 7½ ins; Eaves 6 ft. 0 ins. Width: 7ft. 10½ ins. Length from 6ft. 1in. Can be extended to any length in multiples of 2 ft. wide glass. Supplied with sliding door, roof ventilators, glass, putty and erection booklet. To prevent damage to glass, metal panels are fitted at ground level all round.

Also available:
Side ventilators, staging supports, shelf brackets, dividing partitions, training wire clips.



Made by THE CRITTALL MANUFACTURING CO. LTD · BRAINTREE · ESSEX
Enquiries to: EVINGTON VALLEY ROAD · LEICESTER

WILLIAM LORD (LEEDS) LTD.

POLYANTHUS NURSERIES, BARDSEY, nr. LEEDS

Polyanthus, strong, sturdy seedlings, ready mid-March onwards. All transplanted, 7/6 25, 25/– 100.
Primula Capitata and P. Pulverulenta, year old plants, 10/6 doz., 75/– 100.
Aquilegia, Sutton's Long Spurred hybrids, also Albanian strain, 10/6 doz.
Phlox subulata, Atropurpurea, Fairy, Model, 10/6 doz.
Potentilla Tonguei, verna nana, 12/6 doz.
Delphiniums, large 2-year Blackmore & Langdon's mixed, 24/– doz.
Coreopsis, Grandiflora, 10/6, Baden Gold, 15/– doz.
Pyrethrum, single and double mixed, 10/6 doz.
Sweet Williams, Auricula eyed, White, Pink Beauty, Scarlet Beauty, all 7/6 doz.
Thymus, serpyllum coccineus, Annie Hall, 10/6 doz.
Aethionema Warley Rose, ex 3-in. pots, 12/6 doz.
Arenaria balearica, ex 3-in. pots, 12/6 doz.
Viola gracilis, gracilis lutea, cornuta, 10/6 doz. All ex 3-in. pots.
Dianthus caesius, deltoides erecta, subacaulis, ex 3-in. pots, 10/6 doz.

Send for list of many other rock and herbaceous plants and we will send you a monthly list of plants.

1925–1950

Anniversary now being celebrated at S. F. Grill & Café—"adopted" 25 years ago by most delightful customers who appreciate our food, our flowers and the friendly atmosphere they helped to create. Lunch, tea and "before the show."

The SF Grill Café

6 Denman Street,
Piccadilly Circus, London

"HART"

LAWN GRASS SEED

STANDARD MIXTURE

7 lbs. 10/6 ; 14 lbs. 20/– ; 28 lbs. 39/– ;
56 lbs. 75/– ; 112 lbs. 145/–.

BEST QUALITY MIXTURE (without Rye)

7 lbs. 25/– ; 14 lbs. 46/9 ; 28 lbs. 89/9 ;
56 lbs. 171/3 ; 112 lbs. 337/6.

Carriage Free

Obtainable only from:

MAXWELL M. HART (LONDON) LTD

Sales Dept.: 39 VICTORIA STREET, LONDON, S.W.1

'Phone: ABBey 1774-5 *'Grams:* *Landscape, Sowest, London*

MMH

WHEATCROFT BROS. ON ROSES . . .

Alfred Wheatcroft — Harry Wheatcroft

TO BE SURE OF SATISFACTION

A reputation such as we enjoy is the reward of a lifetime spent in the cultivation of roses of the highest quality.

Through the years our roses have collected a wealth of high honours, so numerous that we have lost count, undisputed evidence of the championship class of our roses.

These two factors are your safeguard when buying roses—your assurance of reliability and quality—and the reason why you can be sure of satisfaction when you plant Wheatcroft Roses.

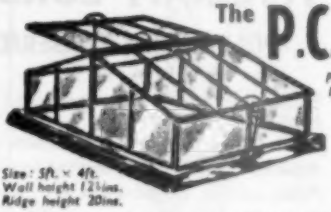
WHEATCROFT
Selected ROSES

WHEATCROFT BROS. LTD. NOTTINGHAM

AMAZING NEW GARDEN FRAME

The **P.C.I.**

Patent 16544



Size: 5ft. × 4ft.
Wall height 12½ins.
Ridge height 20ins.

PRICE, COMPLETE WITH 24-oz. GLASS and GLAZING CLIPS — **£7.17.6** *Carriage Paid*

Erected in a few minutes — with only 8 bolts. Can last a lifetime and save its cost the first season. Order now (cash with order).

The finest garden frame value ever. Strong, metal section frame (permanent, rot-proof). Twenty Square feet for plentiful salad and seedling production. Maximum light for speedy, sturdy growth. Special instant-action catches lock lights firmly in any position. Lights never warp or stick. Draughc-, rain-, and pest-proof. Finished best quality paint.

PREMIER CRAFTS & INDUSTRIES LTD.
Horticultural Div. (Dept. AB), LEATHERHEAD SURREY. *Tel.: Leatherhead 3581 (Pte. Bch. Exch.)*

DEB

FOR SPRING PLANTING

ALL LARGE PLANTS

Sweet Pea Plants :
Autumn-sown . 3/6 per doz.
1 doz. each of 3 varieties . 10/-
1 doz. each of 6 varieties . 19/-
Mixed, same price.

Otley Korean Chrysanthemums :
These lovely flowers are gaining in popularity. We have 24 varieties.
1 each of 6 varieties . . 8/6
1 each of 12 varieties . . 16/6

Early-Flowering Chrysanthemums :
Up to date varieties for cut flowers or exhibition.
1 each of 6 varieties . . 8/6
1 each of 12 varieties . . 16/6

Primulas : 6 choice and rare varieties . 14/-
12 well-known varieties . 17/6
Both collections . . . 30/-
6 popular varieties . . . 9/-

Asters : 3 each, Peace, Plenty and Prosperity 17/6

Asters : Modern kinds, 1 each of 6 varieties 8/6

Aster : Yunnanensis Napsbury, 6 for 11/-, 12 for £1 1s.

Chrysanthemum Max. : Wirral Pride, pure white, 4 to 5 in. across, double 2/- each, 23/- per doz.

Gaillardias : Monarch strain . 12/- per doz.

Russell Lupins : True strain . 12/- per doz.

Erigeron : Azure Beauty, wonderful for cutting, 16/6 per doz.

Erigeron : Quakeress . . 16/6 per doz.

Aubretia : mixed . . . 10/- per doz.

Alyssum compactum . 10/- per doz.

Campanula : Telham Beauty . 16/6 per doz.

Heleniums : 3 each of 4 varieties . . 16/6

Three of any variety supplied at doz. rate.

Astilbes : 2 each of 3 varieties, very large plants . . . 15/-

Pyrethrums : 4 each of E. M. Robinson, Radiant and Scarlet Glow . . 16/6

Viola Orion : Golden yellow, perpetual flowering, scented . 4/- per doz.

Hardy borders : 50 border plants £4 0 0
with plan 100 " " £7 15 0
150 " " £11 10 0

Rockery Collections :
12 choice varieties, including 2 gentians . 14/-
12 easily grown varieties including 1 gentian 12/-
Both, all different . . . 25/-

Gentians : 1 each of 6 varieties . . 9/-

Dwarf Conifers for Rock Garden :
1 each of 6, £2 3 0

Dwarf Shrubs for Rock Garden :
1 each of 6, £1 10 0

Summer Bedding :
Antirrhinums, Alyssum, Asters, Marigolds, Lobelia, Nemesia, Petunias and Stocks . 2/6 per doz.
Dwarf Dahlias . 8/- per doz.
Zinnias . . 3/6 per doz.

Orders under 30/- add 1/6 for packing and postage.

Let us plan and fill your Border. Plan and estimates free.

Write for new Plant List, 1d.

H. G. & P. M. LYALL

Mount Pleasant Lane, Bricket Wood, Watford, Herts.

Garston (Watford) 3098

CONSIDER THE ADVANTAGES...

of installing an Iron Fireman Automatic Coal Stoker to your heating plant:—

- *EARLIER CROPS*
- *CONSTANT DAY & NIGHT GROWING*
- *AUTOMATIC CONTROL OF TEMPERATURES*
- *SUBSTANTIAL ECONOMY OF FUEL*
- *EFFICIENT USE OF CHEAPER LOW-GRADE FUEL*

Our experience, gained from many horticultural installations, is at your service.

ASHWELL & NESBIT LTD., BARKBY RD., LEICESTER

Also at

LONDON, BIRMINGHAM, MANCHESTER, LEEDS & GLASGOW

Sole Manufacturers of

Iron Fireman
Automatic Coal Stokers

A MINISTRY OF AGRICULTURE PUBLICATION

Diseases of Vegetables

The symptoms, influence of cultural practices, and control of vegetable diseases.

A handbook for the grower, based upon the results of recent research.

Illustrated.

Price 3s. 6d. By Post 3s. 9d.

from

H.M. STATIONERY OFFICE

York House, Kingsway, London, WC2 (Post Orders: P.O. Box 569, London SE1); 13a Castle Street, Edinburgh, 2; 39 King Street, Manchester, 2; 2 Edmund Street, Birmingham, 3; 1 St Andrew's Crescent, Cardiff; Tower Lane, Bristol, 1; 80 Chichester Street, Belfast,

or through any bookseller.

NEW SALE OFFICE:
429 Oxford Street, London, W1

CAMELLIAS

In a wide range of varieties from small plants to fine specimens, suitable either for outside plantations or unheated greenhouse—

Particulars on application.

Also available the fragrant Boronias, Hippeastrum (Giant Amaryllis Lily) and large collection of Greenhouse and hardy Shrubs, Grape Vines, Figs, Oranges (named grafted.)

STUART LOW CO.
BUSH HILL PARK, ENFIELD.

Also at Marshmoor Nursery, Hatfield, Herts,—A large collection of Orchids are grown at the Orchid Nursery, Jarvisbrook, Crowborough, Sussex.

Rotoscythe

Expert Repair and Reconditioning Service now available at

Rotoscythe

POWER SPECIALITIES LTD
BATH ROAD WEST . SLOUGH BUCKS

BAMBOO CANES

IMMEDIATE DELIVERY EX-STOCK all per 100

	A. Thin	B. Med.	C. Stout	D. Ex. Stout
1 ft.	2/6	3/–	4/–	5/–
1½ ft.	3/–	4/–	5/–	6/–
2 ft.	7/–	8/–	9/–	10/–
2½ ft.	10/–	15/–	22/6	25/–
3 ft.	12/6	20/–	25/–	30/–
3½ ft.	15/–	25/–	30/–	35/–
4 ft.	20/–	30/–	35/–	40/–
5 ft.	25/–	35/–	45/–	50/–
6 ft.	30/–	40/–	50/–	60/–
7 ft.	40/–	50/–	60/–	70/–
8 ft.	50/–	60/–	70/–	80/–
10 ft.	70/–	80/–	90/–	100/–

For orders up to £1 add 1/– postage. C. Pd. nearest Station C.W.O.

THE BRITISH BAMBOO CANE CO. LTD.
52, LANIVET, BODMIN, CORNWALL

ALUMINIUM

trouble free

GREENHOUSES

Supplied for Royal Horticultural Society's Gardens at Wisley.

First cost is the last with a modern ALUMINIUM GREENHOUSE. Once installed, requires no further attention. Ventilator troubles eliminated. Retains appearance always, without paint or other protection. *Send now for full details.*

Timber houses also supplied. Standard design or special requirements.

COMPLETE MAINTENANCE SERVICE. Heating systems overhauled, repaired, re-modelled. General repairs, painting, glazing, etc. *Estimates free.* Wood lath and other greenhouse blinds supplied to order.

W. RICHARDSON & CO. LTD.

NEASHAM ROAD, DARLINGTON

London Office : 117, Victoria Street, S.W.1

HORTICULTURAL AND HEATING ENGINEERS. *(Established 75 years.)*

Associated Firms: J. WEEKS & CO. (Chelsea). JAMES GRAY (Chelsea). SIMPSON & FARMER (Glasgow)

STERILIZED SOIL AND COMPOSTS

To John Innes Formula

JOHNSTON BROS.

NEW PARK, CRANLEIGH

Metaldehyde

BRITISH MADE

SAFE SOLID FUEL

SLUG & SNAIL KILLER

IN PACKETS, 1/3, 2/4, 5/6

Obtainable from Chemists, Ironmongers & Seedsmen

Sole Concessionaires for the U.K. & Eire

H. R. NAPP LIMITED

3 & 4, Clements Inn, LONDON, W.C.2

THE CHILTERN TREE SURGEONS

(OF AMERSHAM)

Experts in General Tree Preservation

LOPPING AND FELLING OF DANGEROUS TREES

18 Queen Court, Queen Square, W.C.1

TERminus 8394

MARK ALL YOUR BEST PLANTS

WITH

"SERPENT" *Permanent* (Lead)

LABELS

They last 100 years

Neat Legible Unobtrusive

Self-attaching Inexpensive Everlasting

Printed labels to order (any no. of one), from 3/- doz.; 22/- 100

Label blanks from 2/6 doz.; 16/- 100

As used by Royal Botanic Gardens, Kew; H.M. Forestry Commission, etc., etc.

No. 1. Label-machine now available: £15.

Catalogue and free label (*any name*)—

THE "SERPENT" LABEL FACTORY

ROCKBEER, EXETER

For Every Spraying Purpose

Solo speeds—simplifies—
Limewashing, Creosoting, Insecticides
etc. Money back guarantee.

SEND FOR BOOKLET

Solo COMPLETE 37/6 NO EXTRAS
ONE MAN SPRAY

F.H.P. MANUFACTURING CO., LTD.
(Dept., R.H.) 86, Gracechurch Street, London, E.C.3

Don't forget! the Break-point is 545 lbs.

Cheaper than string—
stronger than rope . . .

FAULTY TELEPHONE WIRE

Insulated, waterproof, suitable for pasting, fencing, horticulture, etc.

55/- PER MILE COIL MIN. QUANTITY 1,000 ft. **20/-**

Immediate delivery. Carriage paid. Send for free sample.
Dept. 86, c o STREETS, 110 Old Broad St., London E.C.2

KETTERING LOAM

Yellow Fibrous as supplied for many years to the leading Nurserymen and Horticulturists. From our own virgin loam fields. Quotations from 1 cwt. to truck loads.

Also Bedfordshire Silver Sand and Nottingham Marl.

KETTERING FUEL CO. LTD.
28a STATION RD. KETTERING
NORTHANTS
Telephone: 3059

OSIER OR HAZEL WATTLES.

"SOUTHDOWN". CLEFT CHESTNUT

FENCING AND GATES OF EVERY TYPE SUPPLIED AND FIXED.
INCLUDING TENNIS COURT SURROUNDS

GERALD GILMER LTD.
Southdown Works, South Street
LEWES. TEL: 456. EST: 1922

DERBYSHIRE SPAR CHIPPINGS

A washed and screened cream coloured GRAVEL
ideal for
DRIVES, PATHS, ROCKERIES, GREENHOUSE BENCHES ETC.

In 1 cwt. bags 7/6 delivered
quotations for bulk supplies

MIDDLETON MINING COMPANY LTD.,
MIDDLETON ESTATE OFFICE,
BAKEWELL, DERBYSHIRE.

SAND CULTURE
OF
CARNATIONS, CHRYSANTHEMUMS, DAHLIAS ETC., ALSO ALL BULBS, CORMS AND TUBERS IS SIMPLICITY WHEN USING

SSS FERTILISER HICKS ORIGINAL FORMULA
Packets 2/6 plus postage, 1 packet 6d., 2 packets 9d.

SSS IMPREGNATED SAND THE CORRECT SAND FOR ALL **SAND CULTURE**
7/- per cwt., plus carriage.

Trade Enquiries Invited—Leaflets from :—
HORTICULTURAL FERTILISERS AND SUNDRIES LIMITED
SUNBURY-ON-THAMES, MIDDLESEX

PEAS FOR SUCCESSION

YATES' PEAS :—
EVESHAM No. 1
DWARF WONDER
BANTAM
CHELTONIAN
LAST OF ALL

An ideal selection to provide a succession of peas from the earliest to the latest, at the special price of
11/- for 1 pint each sort
5/9 for ½ pint each sort

Post free—1938 Garden Guide on request.

Yates & Sons (1865) LTD.
PEDIGREE SEEDS
EVESHAM, WORCS.

ACME NAMED **LABELS**

RAISED LETTERS, PERMANENT, NON-RUSTING, NAMED TO ORDER

AS USED IN THE R.H.S. GARDENS AT WISLEY.
N.R.S. TRIAL GROUNDS, L.C.C. AND OTHER COUNCILS.

ALSO NOTICE AND COMMEMORATION PLATES, ANY SIZE, ANY WORDING

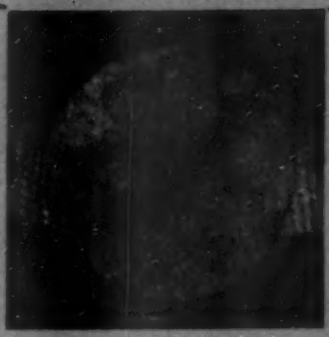
Price List from
JOHN PINCHES (ACME LABELS) **LTD.,**
3, CROWN BUILDINGS, CROWN STREET, LONDON, S.E. 5

DAHLIAS FUCHSIAS CHRYSANTHEMUMS

Early days of Spring and we think again of the joys of Summer—holidays and garden colour. Dahlias and Fuchsias provide a rich display for many weeks and Chrysanthemums array September with their beauty. You will find in our "Spring Guide to Summer Colour" a choice of special worth and we shall be glad to send you a copy if you write.

Jackmans of Woking

GEO. JACKMAN & SON (WOKING NURSERIES), LTD., WOKING, SURREY



FRUIT TREES & BUSHES—

a valuable investment

Apples: Bush, 3 years, Approved Malling Stock, suitable for average garden, 11/6 each; any 3, 33/-; any 6, 63/-. Bush, 5 years, 10/- each; any 3, 28/6; any 6, 54/-.

Dessert: Allington Pippin, Cox's Orange Pippin, Ellison's Orange, Sunset, Worcester Pearmain.

Cooking: Bramley's Seedling, Early Victoria, Lane's Prince Albert, Newton Wonder, Warner's King.

Peaches: Bush, for outside culture, 14/6 each. Royal George, Waterloo, etc.

Fan-trained, Peregrine, for wall culture, 21/- each.

Plums: Bush, 3 years, 11/6 each; any 3, 33/-. Belle de Louvain, Czar, Green Gage, Victoria.

Standards, bearing size, 18/- each; any 3, 52/-. Belle de Louvain, Bryanston Gage, Czar, Oullin's Golden Gage.

Black Currants: 2 years, certified, strong bushes, 6 for 9/6; 12 for 17/6. Baldwin's, Hendje Cross, Seabrook's.

Blackberries, Loganberries, Boysenberries: Strong bushes, 3 for 12/-; 6 for 22/6. (Stake which required.)

Gooseberries: Strong bushes, cooking and dessert, 3 for 10/-; 6 for 18/-.

Raspberries: Strong planting canes, certified stock, Norfolk Giant, 7/- dozen; 50 for 25/-.

Bush Roses: English grown, all modern and different varieties, 3 for 24/-; 12 for 48/-.

All carriage paid.

ASPARAGUS. Connover's Colossal.

We have a particularly fine strain of Asparagus which we can confidently recommend.

The culture of Asparagus is not as difficult as is generally supposed and it will thrive in practically any soil providing that it is correctly prepared. The beds should be 3 ft. wide and 12 ins. high. Plant end of March to the end of April in rich well manured sandy soil 15-18 ins. apart in the rows. Do not expose the roots any more than is absolutely necessary when planting.

Per March to April delivery, price per dozen, and per 100

Four-years (suitable for forcing) 13/4 and 95/-; Three-years 10/6 and 80/-; Two-years 8/- and 60/-

We shall be pleased to send you our current catalogue.

1. **Bide's Surrey Grown Roses.**
2. **Bide's Fruit Trees and Shrubs.**
3. **1950 Seed Catalogue.**

Kindly state which you require.

BIDE'S of FARNHAM

8, Alma Nurseries, Farnham, Surrey

(A. Bide & Sons, Ltd.) *Nurserymen for 96 years*

'FRUIT GROWING FOR AMATEURS'

The above illustrations of four popular apple varieties appear in full colour in Plant Protection's new book covering the cultivation of trees and soft fruits. Many other coloured plates depicting damage caused by pests and diseases are included.

PRESS OPINIONS:

'. . . should be the first acquisition by all who wish to grow good fruits'.
The Gardeners' Chronicle

'. . . informative, easy to read and attractively laid out and its high standard augurs well for following volumes in this series'.
The Fruit Grower

FROM BOOKSELLERS EVERYWHERE

8/6

DISTRIBUTED BY SIMPKIN MARSHALL (1941) LTD.
for PLANT PROTECTION LTD.

Printed by Spottiswoode, Ballantyne & Co. Ltd., London and Colchester.